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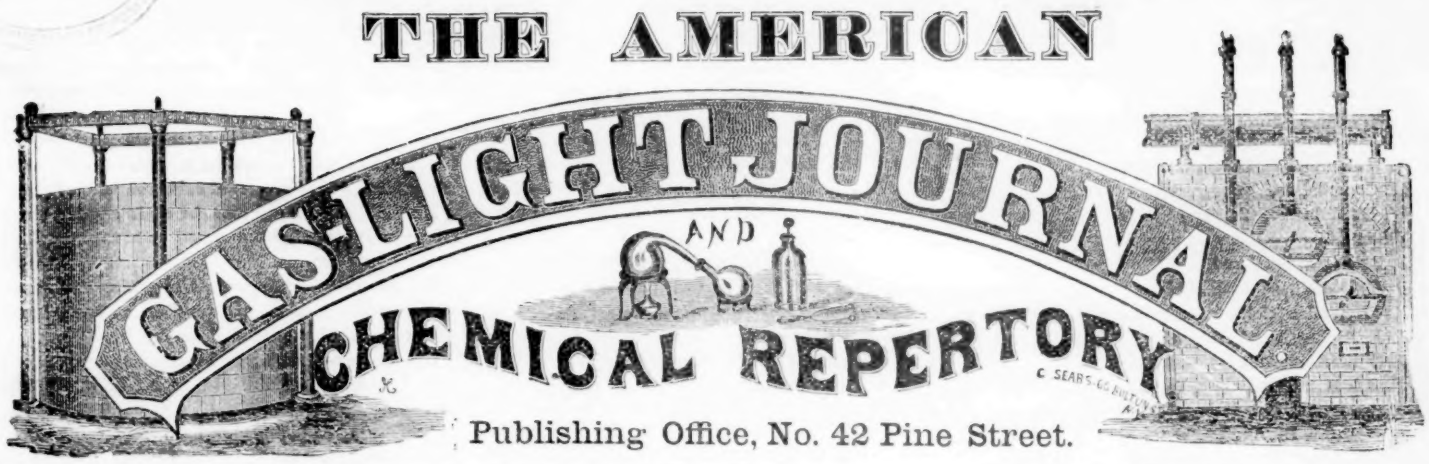

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Gas-Light Association of the United States.

PROCEEDINGS OF THE SECOND SEMI-ANNUAL MEETING OF THE GAS-LIGHT ASSOCIATION OF THE UNITED STATES, HELD IN CLEVELAND MAY 13, 1874.

The minutes of the last annual meeting were then read by the Secretary and approved.

Mr. Hickenlooper said:

Without being familiar with the early proceedings of the Association, and without hearing anything in the minutes to enlighten me on the subject, the matter would very properly come under the order of general business; but under the order of business you have established, I would ask whether there has been any rule decided upon as to the eligibility of members of the Association. The constitution provides that gas companies in their corporate capacity, or individuals engaged in the supplying of towns and cities with gas, are alone eligible to membership. I desire to know whether members of the profession are eligible as members of the convention.

The President:

In reply to the remarks of General Hickenlooper, I will say while it is true that the constitution provides that Gas Light Companies shall constitute this association, it also provides that individuals engaged in the business of making and distributing gas to cities and towns, may also become members, whether they are acting under a corporation or not; and it is also true that each gas light company being a member of this association is entitled to 3 delegates in the meeting. They may send their engineer, their president, or any of their directors, or any of their stockholders, if they please; so that, in that sense, where any person holds such a relation to a gas company, he is entitled to membership, or at any rate, to sit in the association as a representative member.

Mr. Hickenlooper:

Mr. President: I am peculiarly situated, probably differently from many of the gentleman present—that is, I am not here as a representative of a gas company, I have no authority to do that. I am simply an officer or employee of that company, and as such to them my services are more or less valuable. If I can improve the value of my services, it is for their benefit—of course if I cannot perform my duties to their satisfaction, they will find somebody else who can. I act for them individually, but by virtue of my employment. Now, the constitution says that the membership of the association shall consist of the several organized companies, and all individuals engaged in supplying cities and towns with gas. I am neither of these. It appears to me that the English association is a little different in its construction from your gas light association—that its membership consists of engineers and members of the profession. Now, I suppose the present is not a proper time to discuss this matter, nor do I know that the Convention have any disposition to do it; but under this strict construction of the constitution, I would certainly be ruled out, and it appears to me that instead of gas-light companies, it should be officers or employees, or the superintendents or managers of a regularly organized gas company; but I will waive the point now until it comes up under the general order of business.

The President—Perhaps literally and closely interpreted the constitution would not cover your case, but I think it is not stretching the constitution very much to say that it is perfectly proper for you to sit here as a member of this convention, and as a member of this association. When the constitution of our association was adopted, we had a great deal of trouble, about this same question, and we had the same trouble at the annual meeting in October—it is pretty difficult to adjust the membership precisely. On the one hand we were unwilling to confine the association simply to those who would only act in the scientific capacity, and who were mainly engaged in the business of construction. We wished to include the financial and managing talent of gas companies as well—on the whole it was thought best to organise as we did. I know there are difficulties attending it. Of course everyone would be very glad to have General Hickenlooper attend this convention, be a member of it, act with it—and I think the difficulty may be entirely overcome by inviting all persons sitting to become, for the time being, corresponding members, or honorary members, perhaps not strictly entitled to vote, at the same time contributing their portion of intelligence and experience to the common stock. I shall be very glad to hear suggestions.

Mr. Nettleton—Mr. President: It is my understanding that at the discussion we had at the last annual meeting, this question had been settled by the convention—that any gentleman who presented himself from any company, or gas works, would be permitted to come into the convention, and would be desired to take part, and vote, provided no more than three from any gas works were admitted.

The President—What is the understanding of other gentlemen who were present in New York at the meeting in October?

Mr. Hickenlooper—If this was the feeling of the association it appears to me it should be expressed in a more emphatic way; that if intended to include the Treasurer, President, Vice President, Secretary, Superintendent, and Manager, it can be expressed in words. Now any action which may be taken by the representatives of a company here cannot affect that company. They are not interested in the affairs of this association, they employ talent and they pay for it. Their Board of Directors engages a man to perform certain services; if he does not possess the ability they find somebody who does My company is not interested in anything this association does at all. They don't care whether a process is improved, or whether it is not improved. They employ men to perform that service, and the very moment they fail that moment their heads are taken off, and they find some one who can. It is not information you can communicate to a corporated body, but to the men who perform labor for the company, to render their services more or less valuable.

The President—Of course it is scarcely worth while to go into any general discussion of our constitution. We have already spent a great deal of time over that, but I hope some arrangement will be made by which the gentleman will become a member of the association, and that we shall have the benefit of his experience and suggestions, and at the same time be able to go forward without undertaking at present to change the constitution, but a committee might be appointed to revise the constitution and make amendments to be acted upon at the next meeting.

Mr. Hickenlooper—I suggest that the matter be deferred until the consideration of general business. Agreed.

The secretary then called the roll, and the following gentlemen responded to their names:

F. C. Sherman, Worcester, Mass.
George Dwight, Springfield, Mass.
W. B. Brooks, Dorchester, Mass.
T. I. Pishon, Roxbury, Mass.
H. Cartwright, Bridgeport, Conn.
E. W. Leavenworth, Syracuse, N. Y.
A. C. Wood, Syracuse, N. Y.
O. G. Steele, Buffalo, N. Y.
W. Henry White, Brooklyn, N. Y.
Charles Nettleton, Mount Vernon, N. Y.
W. H. Grenelle, Brooklyn, N. Y.
J. R. Floyd, Albany, N. Y.
L. C. Kingsbury, Corning, N. Y.
C. S. Cole, Corning, N. Y.
J. McDougall, Dunkirk, N. Y.
A. J. Avery, Dunkirk, N. Y.
W. W. Hague, Kingston, N. Y.
W. L. Williams, Paterson, N. J.
R. Beachem, Columbia, Pa.
W. H. Denniston, Pittsburg, Pa.
L. H. Severance, Titusville, Pa.
Thomas Curley, Wilmington, Del.
Geo. A. McIlhenny, Washington, D. C.
Thomas Turner, Charleston, S. C.
Geo. S. Hookey, Augusta, Ga.
W. H. Price, Cleveland, Ohio.
G. A. Hyde, Cleveland, Ohio.
J. H. Morley, Cleveland, Ohio.
Joseph Clegg, Dayton, Ohio.
Joseph Light, Dayton, Ohio.
A. B. Robinson, Columbus, Ohio.
H. W. Miller, Columbus, Ohio.
E. McMillin, Ironton, Ohio.
E. Printz, Zanesville, Ohio.

John Bousfield, Cleveland, Ohio.
E. Lindsley, Cleveland, Ohio.
B. F. Reinmund, Lancaster, Ohio.
J. C. Buxton, Springfield, Ohio.
A. Hickenlooper, Cincinnati, Ohio.
M. Coombs, Jr., Youngstown, Ohio.
W. H. Williams, Chicago, Ill.
William Dunbar, New Albany, Ind.
J. F. Marsh, La Porte, Ind.
P. E. DeMill, Detroit, Mich.
R. M. Wilder, Coldwater, Mich.
J. J. Tucker, Flint, Mich.
J. C. Sterling, Monroe, Mich
Joseph Hendley, Beloit, Wis.
James H. Walker, Milwaukee, Wis.
R. Spencer, Burlington, Iowa.
H. H. Sibley, St. Pau', Minn.
W. W. Goodwin, Sacramento, Cal.
Thomas Rankin, Louisville, Ky.
F. W. Gates, Hamilton, Canada.
Thomas Littlehales, Hamilton, Canada.
H. Thompson, Toronto, Canada.

The President—I wish to call the attention of the convention to the fact that several gentlemen from Ontario, on the other side of the lakes, are present, who are practically engaged in making and distributing gas, and perhaps, strictly speaking, our constitution does not enable them to become members of the association. I hope we may devise some way by which they can act with us.

Mr. Nettleton—I move, Mr. President, that the gentlemen referred to be invited to sit with the convention, and participate in all its proceedings, except voting.

Mr. Sibley—Would it be proper to elect them as honorary members?

The President—That we cannot do; but we can invite them to sit at this convention, and then submit the whole matter to a committee to revise the constitution so that they can be brought in properly.

Mr. Hickenlooper—Mr. President, is there any provision to the constitution for electing honorary members?

The President—There is no specific provision, but I suppose it is the common law of any organization.

Mr. Hickenlooper—I do not believe it is. I hope this matter may go to some committee. Some gentlemen desire that a committee should be appointed for the purpose of considering amandments to the constitution, let that provision be also considered by them.

Mr. Spencer—It might be well that the provision should also embrace persons on this side of the lakes, and settle this question of membership heretofore discussed, for the present.

The motion of Mr. Nettleton was then adopted.

Mr. Gates—Mr. President and gentlemen of the convention, we heartily thank you for the honor you have done us in permitting us to participate in your deliberations.

The President—I think I may say we are very happy to welcome our friends from the other side of the lakes, and we hope to be benefitted by the information and experience which they may bring to us.

The next matter in order is the report of the executive committee.

No report.

The Secretary then read letters from the following gentlemen: Prof. Henry Wurtz, Hoboken, N. J., Prof. J. Lawrence Smith, Louisville, Ky.; George W. Parsons, Rochester, N. Y.; E. T. Watkins, Chicago, Ill.; J. R. Smedberg, San Francisco, Cal., and J. Herzog, N. Y.

The Treasurer (Mr. De Mill) then made a report as treasurer of the association, which was referred, on motion, to Messrs. Steele and McIlhenny as auditing committee, to report to the convention.

The President—About two weeks since I was shown a letter by a member of this association, which struck me very favorably, suggesting that there should be something like a banquet during the session of the convention; that the convention should meet socially around some board, to be provided in this city, and I wrote to Mr. De Mill that I thought it a very excellent idea, but that I did not see very well how we could provide for any specific number, for we did not know how many would be present, and that it would be best to decide upon it after the convention should assemble. In order to have that thing accomplished, if it meets the approval of the convention, it is desired that we take some action now. If the movement meets with the favor of the convention it will not be very difficult to get up a plain, pleasant banquet, to which we can do justice, I presume.

Mr. Cartwright—I would ask whether we would be guaranteed exemption from the crusaders?

The President—I wrote Mr. De Mill, that in view of the present state of public sentiment in Cleveland, it would be necessary to exclude all wines and liquors (laughter).

Mr. White—Mr. President, I object to the elimination of wines from banquets.

Mr. McIlhenny—Mr. President; we have some gentlemen among us here who are members of the New England Association of Gas Engineers, and I would like to hear from them.

Mr. Sherman—A very pleasant part of the business of our association is the banquet. We should feel very much lost if we did not have a chance to enjoy social intercourse together. I think no one would regret having such pleasant intercourse as we might have on such an occasion.

Mr. Hickenlooper—I think Mr. Sherman has failed to enlighten us on the most essential point, as to the custom of his association in the use of intoxicating liquors at its banquets.

Mr. Sherman—If the gentleman should come down there he would see what we have to drink.

Mr. McIlhenny—I will state that I had the pleasure of attending one of the meetings of that association, last August at Portland, and the main feature of the meeting was the banquet. I must say that the intellectual part did not strike me as being very forcible; but the banquet certainly struck me with a good deal of pleasure. They all enjoyed themselves very much, and had a very cheerful time, and on the excursion down the bay had plenty to eat and drink, and of the best quality—a jovial time—and we all went home very much satisfied with the trip. Now, if we do not get an intellectual treat you certainly want a sort of physical remuneration for your trouble, time, etc.

The President—The letter I refer to was written by Mr. McIlhenny, and it struck me very favorably. Of course the great point is the intellectual feast: but it seems to me if we could have a supper, not an extravagant, not a drunken supper by any means, but a good sensible supper, it would be a very pleasant thing, and would bring us all socially together better than in any other way. The convention would perhaps like to hear from Mr. Steele, and other gentlemen, on the subject.

Mr. Steele—If I wanted to drink I would like to have the chance. I would suggest that the whole matter be referred to the President with power.

The President—I should object to having it referred to me alone.

Mr. Walker—Mr. President, I move that we *do* have a supper, and that a committee be appointed for that purpose.

Mr. Spencer—I don't know whether we have time. If we are to have a supper are we to have it to-night or to morrow night, or the latter part of the week, or when is it to be? A question not determined yet is, whether this convention will hold its sessions longer than to-day; if it will not, we had better have the supper to-night, if at all. If the meeting adjourns to to-morrow evening, those of us who live a good ways off will probably be inclined to take the night train home; and the trains leave too early to go after supper, and some of us may not be in a condition after supper to go anyhow; so I think it is a question for this body to consider whether we have time to engage in a banquet on this occasion; if so, when is it to be?

The President—My impression is, if it is to be had at all, it must be had this evening. Of course we will endeavor to do all the business we can this afternoon, and if we adjourn over to-morrow, I presume it will be impossible to keep the members all here to-morrow.

Mr. Hickenlooper—I would suggest that the consideration of this matter be postponed, and in lieu thereof, have the banquet at each annual meeting.

Mr. Walker—I move that the chair appoint a committee to report after the recess, as to the expediency of having a banquet.

Mr. Floyd—For the purpose of getting the sense of the convention upon the question at once, I move that we have a banquet this evening.

Mr. Walker—I withdraw my motion.

The motion of Mr. Floyd to hold a banquet was lost.

The President—There has been a committee on by-laws appointed. We have no by-laws. I would like to know whether that committee is prepared to report. Who are the committee?

Mr. De Mill—That I do not know, but there was a committee appointed on by-laws at the first meeting; and by-laws are essential and necessary to carry out your constitution, as it does not seem to be wholly understood by the gentleman from Cincinnati. I think some of the gentlemen here are on that committee, and must recollect being appointed, and can say whether they are prepared to make a report or not.

The President—I remember distinctly that there was a committee appointed, but I do not remember the names of the committee. It was appointed at the organization of the association; and I venture to say no report has ever been proposed. I think we may fairly consider that committee has lapsed, and a new committee should be appointed. The secretary says he knows of no record of any such committee.

Mr. McIlhenny—I move we have a committee to draft by-laws.

The motion was carried.

Mr. Williams of Chicago, then presented his report on insurance.

Mr. De Mill—I think this matter of the report on insurance is of very great importance, and one that deserves from this association a great deal of earnest consideration. It does not ask anything of the association; it simply submits a principle, and I should like to have it referred to a committee to report at our meeting.

The President—I have not the slightest idea of giving this report the go-by in any way whatever; but it seems to me to be an important question, whether this association should embark into the business of insurance. It certainly should be read and discussed before it is referred. If the convention wish it may be read.

Mr. Hickenlooper—I move that the report be laid on the table, and that the chair appoint a committee on by-laws, to report to-night. We had better do one thing at a time,

The chair appointed Messrs. Nettleton, Sibley and Steele upon the committee on by-laws.

The report of Mr. Williams on insurance was then read by the secretary.

Mr. De Mill—We can now see how cheaply we can protect ourselves. We insure to the amount of $30,000 and more, and we pay a premium of $300, and it could be done for one-third of the money under this plan, and the company would be very glad to avail itself of some such organization. It has a great deal of property that cannot be insured.

Mr. Cartwright—I move that the paper be received and placed on file for future reference, in case the subject of insurance should be taken up for future action. Carried.

Mr. Cartwright—I would move that the thanks of this convention be tendered to Mr. Williams for his labors in this direction. Carried.

On motion of Mr. Sibley, the convention took a recess until 2 o'clock P. M.

AFTERNOON SESSION.

The Secretary (Mr. De Mill) being absent, Mr. Hague was elected Secretary pro tem.

The President—The next business before the convention is reading of papers.

Mr. Steel—I would state, gentlemen, that I was requested by Mr. De Mill to prepare a paper for this occasion. I am not a gas engineer nor constructor; but I have had a good deal to do with the management of gas works, and what I have to say is merely some suggestions in the way of experience, which I hope you will consider as my part of duty on this occasion.

THE MANAGEMENT OF GAS WORKS.

BY OSCAR G. STEELE,

Secretary and Superintendent of the Buffalo Gas-Light Company.

I have been requested to prepare a paper on some subject connected with the objects of this association, to be read at this meeting.

I will make an attempt to do so, and regret that I cannot address you upon that portion of the declared objects which relate to construction and manufacturing.

My connection with the business of gas making has been of a business character only. I am not a gas engineer, know little of the science of construction, or of manufacturing, except as incidentally acquired during a quarter of a century connection with the business department.

My position has been that of a gas company manager, and to this department I shall mainly endeavor to confine my remarks.

My connection with the gas business arose from circumstances which might occur with any party.

When the subject was first agitated in our city, which was in 1847, I became interested in it as a great public improvement. The business was very little known in our State. New York had been supplied for some years, and Albany for a very short time. The movement to erect gas works was looked upon with little favor as a business enterprise, although all appeared anxious to have it succeed, as a matter of public convenience and personal luxury. But, notwithstanding the general desire to have the city supplied with gas, and the streets lighted, few individuals were disposed to invest their money in what appeared to be so doubtful an experiment.

After great effort, a sufficient amount of stock was taken to justify the proprietors of the enterprise in going on with the works, although it was scarcely one-fourth of the amount necessary to complete them, ready for the transaction of business.

The chief motive for proceeding with the enterprise was public spirit, an earnest desire to obtain what was conceded to be a great public improvement. The science of the business, or the expectation of ultimate profit, had little to do with it for several years after its completion.

But a few years changed the relations of the business. The change from the oil, camphene, and candles was very pleasant; but the novelty soon wore away. Gas cost money as well as oil and candles, and the same spirit of economy required feeding as before. The gas supply could not be kept up, without regular and prompt pay, a habit which, with a considerable portion of every community, is not easily acquired. And it soon began to be suspected that the public spirited proprietors of this great public improvement, might possibly be making money out of it. Certainly those parties who risked their funds in the enterprise, had a hope at least, that it might eventually be a paying business. That this result has been reached by most of the gas organizations in the larger cities and towns, is undoubtedly true; but as soon as it was popularly understood to be a success, the profits were greatly exaggerated in the public mind.

From that period in the history of nearly every gas company in the country, the state of public opinion has been such as to render the management of a gas works in a large city, a labor of anxiety, which only those who have been identified with it, can comprehend.

To the average citizen, the gas company was a great monopoly, making and distributing into every house-hold an article which cost nothing, and who were inexorable in demanding pay for it. It mattered but little what the real state of the business was, it was sufficient that pay was demanded, and collected, or the supply would be stopped.

It never seemed to occur to parties that they still possessed the inalienable right to refuse to use the gas, and fall back upon the ancient and venerable privilege of using oil and candles, nor that even the dealer in oil and candles would also stop the supplies if his articles were not paid for. Nor did it occur to them that they might take the advice of Dr. Franklin to the citizens of Paris, when they complained of the great cost of candles, that they could go to bed at dark and get up at daylight, and thus avoid the intolerable expense of candles, circumvent the wax and tallow chandlers, besides greatly promoting their own health and capacity for industrial pursuits.

The "inherent right to grumble," which we have inherited from our English ancestors, finds ample room for improvement in everything relating to the gas supply. In no other department, except possibly taxes, is there such constant and universal complaint. Many people talk and act as if every penny paid to a gas company was extorted without consideration, and this feeling is without the slightest reference to the price charged for the article. The feeling is just as prevalent where gas is sold at a very low figure, as at a high one. The gas company is denounced all the same.

In England where the supply of coal, cost of construction, and price of labor, enables the public to have gas at lower rates than in any other part of the world; there is the same chronic fault-finding as in countries where its cost is five times as much.

But great and unreasonable as is this feeling of dissatisfaction, there are many reasons why it should be so. Few people know anything of the detail of the cost of construction of gas works, or of the process and cost of manufacture, and still fewer will take the trouble to investigate it in any respect. It is generally understood that it is made from bituminous coal, which costs from 5 to 8 dollars per ton, according to locality. It is also popularly believed that coal will produce from eight to ten thousand feet of gas per ton. The rapid conclusion is that a ton of coal costing five or six dollars, produces $25 to $30 worth of gas, and the difference between the cost of the coal and the market value of the gas is all profit. It may seem strange among men of business that such an impression should exist; but it is quite universal, as every gas works manager must be aware.

Other elements combine to create dissatisfaction. Very few consumers know anything of the principles and working of a gas meter. Their bills vary somewhat for different terms, sometimes very widely, and they cannot understand why it is so. And when it is shown by examination of the meter that the statement is correct, then the accuracy of the meter is questioned. An offer to test the meter under the requirements of law, is usually treated with contempt.

And then the system which must control the gas supply seems to many persons too rigid and arbitrary. The meter is the arbiter between the company and the consumer, and cannot with any safety be varied from. That the instrument is one of the most ingenious, as well as accurate measures ever invented, is well known to those who know its principles and the general accuracy of its work; but when its decisions do not sustain the views of the consumer, there is no language too strong to use in denouncing its infallibility.

That slight variations sometimes occur from improper location of meter, affecting the state of the atmosphere, is conceded; but rarely work against the consumer, and, when shown, are rectified without loss. But still there is the same doubt and mistrust prevailing to an unlimited extent.

All these things have to be met in a cheerful spirit. Nothing is lost by spending time in making explanations to parties disposed to fairly investigate, and it rarely fails to satisfy fair-minded men. But the great body of consumers still have their doubts and misgivings as to the fairness of the gas supply. The complaints often made partake of a ludicrous character. It is not uncommon for parties to complain that the gas furnished them is inferior to that furnished to their next door neighbor, and they are obliged to pay the same price for poorer gas. Charges are also frequently made that the gas is diluted, or purposely made poor, to increase registration without increasing light, and so on *ad infinitum*. It is sometimes difficult to meet such contradictory and incongruous complaints, but it is one of the crosses which a gas manager has to bear, and must be met and endured with such Christian philosophy as poor human nature can command. It is an element connected with the business, and those who conduct it must discipline themselves accordingly.

But the general principles of gas supply should be well understood by us all, and we should be prepared at all times to meet freely and manfully the unjustifiable prejudice against us." Let us consider briefly the basis of our business, and the principles which underlie the whole.

In the progress of civilization the use of the night has been constantly encroaching upon that of the day.

In the early ages of the world, day was day, and night was night. As the means of producing artificial light increased, the nights became more used for business as well as amusement, until a large portion of the night was turned into day by the improvements in producing artificial light.

From pine knots to wax candles, was a great advance; but, since in the early part of the present century, the discovery of gas, and its adaptation to every requirement of lighting, were made, all other methods of lighting have been suspended.

It became necessary for manufactories on a large scale to be created, to meet the popular demand. The great expense attending it, made it necessary to combine capital, by corporate organizations, as was first done in London.

The process of manufacture was, however, very crude, and great losses were incurred before permanent success was reached. This was finally accomplished by skill and perseverance. For some years the business was unprofitable, and only became profitable after great improvements in manufacture and distribution had been effected.

Its great superiority over all previous light, soon brought it into general use throughout England, and has since worked its way into every civilized community.

As improvements were made, and gas came into general use, the profits of the business increased, and soon brought jealousies and competition, which have since been constantly connected with the business.

Every town where it was first introduced, felt that it had made a great stride in providing for public wants and conveniences. But success in a financial way, by the companies, was not so agreeable to consumers.

Non-stockholders feared the companies were making too much, and every obstacle was thrown in their way. The nature of the business is such that progress is inevitable, and companies are obliged to look constantly ahead to provide for public wants. This serious necessity but increased the responsibilities of gas companies, and also the prejudices against them. Every scheme which could be devised by jealous or interested parties, is eagerly seized upon to embarass existing companies, and create by every means an unfair competition. The sympathies of the public are always with every effort at competition or embarassment to existing companies.

The result has been almost constant warfare, compelling companies to protect themselves as best they could, while new companies, with the popular sympathy, pressed in every way possible, to divide, at least, the profits of the existing companies. Many of these movements in large cities have been successful to the proprietors, who, in the rapid growth, have made a business for themselves.

But no instance can be shown where the public derived any benefit from the organization of a new and competing gas company. Division of territory or consolidation of interests have been the results in all cases, without permanent benefit to the city or to the citizens. It is not necessary to dwell upon these issues—they will work out for themselves.

The cry of monopoly is kept up persistently, and with some degree of plausibility. Let us look at this subject in the light of experience.

1. Gas companies are manufacturing corporations, for the purpose of making and selling gas to such as desire it, constructing their works and laying pipes, relying for remuneration on their ability to furnish light better and cheaper than by any other method

2. Gas companies are organized under special or general laws, but have no monopoly, being simply authorized to make and sell gas. New companies can at any time be authorized upon the same territory.

3. No company possesses power to enforce the use of its light, or its continuance by any consumer any longer than is for his own interest or pleasure; and we are subject to competition from every other known method of lighting, or which may hereafter be invented.

4. They are, in short, manufacturing corporations, producing an article of prime necessity at lower rates than any other process; and are dependent for success upon this fact, and the judicious management of their business.

5. A gas works, from its character, is a local institution, and can prosper only by identifying its own interests with that of the community. When once constructed and its pipes laid, it cannot be removed, nor its business changed.

Such are the facts in regard to the status of gas companies. The charge of monopoly is therefore groundless. With this state of things the duty of managers of gas works is to meet the wants, and even the clamor of interested parties, in a spirit of equal and exact justice to all.

Every precaution should be taken to manufacture and distribute gas of the best quality which can be made from the materials within its reach, and as near as possible of a uniform quality. The street pipes and fittings should be of the most perfect character, for the mutual benefit of company and consumer.

In its supply of meters, which is the basis of all its business, no pains should be spared in obtaining those of the best quality for accuracy and permanency. Its testing apparatus for meters and burners should be perfect, and accessible to every consumer at all reasonable times, that every one can see for himself, if he desires it, the actual condition of meters and burners.

When any one desires an explanation of anything connected with his gas supply, give every attention to his request, concealing nothing from any one who really desires information.

In short—let us in all our dealings with the public, or with individuals, transact our business on business principles, and do right at all times, regardless of injustice done to us. At the same time it is not required of us that we should do this in an apologetic or subservient spirit.

The making and selling of gaslight is just as honorable a business as any other in any community. It furnishes an article which is better than all others to every household and place of business on its lines of pipe, and at prices which command its use for the interest of every party who uses it. If not satisfactory no one is obliged to continue its use.

This service is entitled to fair remuneration, like all other business. In short—the interests of the company and its customers should be mutual in gas business, as in that of all others, where buyers and sellers meet on common ground.

With these principles the business of gas-lighting should be ranked among our permanent industries, and entitled to the same consideration as that of any other legitimate business. By following out strictly these principles of doing business, we shall command the confidence of fair minded men in all communities, and with which we must endure the attacks of all others.

I think I do not assume too much when I say that the officers and managers of the gas companies, in all parts of our country, are composed of men at least as respectable and honorable as are to be found in any other branch of business. I have had personal intercourse with a large number of gas companies, and correspondence with many more, in this country and in Europe; and I have always found their officers and managers men of character and intellect, and of high moral standing in their communities. Certainly no other profession exhibits less of the demoralization of character, in the transaction of general business, than ours.

For this I claim nothing, for every man of any corporation should do right to the community from which it derives its business and patronage; but I do claim that in all the qualities which make good men and good citizens, the officers and managers of gas companies are at least the peers of all others. Let us in the justice and fairness of our business with the public, keep these principles constantly in view in the future as I feel assured we have done in the past.

The President—I am very sure every member of the association will feel very grateful to Mr. Steele for the very able paper he has read to us.

Mr. Rankin—I move a vote of thanks be tendered to Mr. Steele for his address. Adopted.

Mr. McIlhenny—I desire to qualify a statement that I made before the recess, that the intellectual part of the proceedings of the New England Association did not strike me very forcibly. I meant that with regard to the general proceedings at the time, and not to the individuals. At the last meeting of this association, I promised to submit some remarks upon a subject I have taken a great deal of interest in, and I now comply with promise.

DEPOSITION OF CARBON IN RETORTS AND MEANS OF PREVENTING IT.

By George A. McIlhenny,

Engineer of the Washington Gas-Light Company, District of Columbia.

Mr. President: The subject on which I propose to make a few remarks, is the deposit of carbon in retorts, and the means of preventing it. This subject, although perhaps the most important connected with the manufacture of gas from coal, has received the least consideration, but I am pleased to say that within the past few years more interest has been, and is being manifested.

The accumulation of carbon as an incrustation on the inside of retorts, commences with the distillation of coal for making gas, and no means has as yet been devised to *entirely* prevent it. Why it is that this subject has not received more attention has often astonished me. It cannot be that it could be forgotten by any manager of a retort house, who gave that part of his duties even a passing notice; because it is ever present, and its growth is a sure crop; it is like a vigorous cancer with regard to its constant growth and certain return. It may be called the pest of the retort house and the torment of the engineer.

When it is removed it is sure to return, and again and again has this process of removal got to be repeated; in fact it is as much of a duty and custom in some works as to draw and charge the retorts, and almost as important. Why this indifference, apparent or real, towards a subject involving so much pecuniary interest? The only way that I have ever been able to account for it is the fact of the difficulties that stared every one in the face, without having the means to overcome them, and the natural tendency of men to shrink from difficulties that they have no reasonable hope of overcoming: and another class of men do not even take the trouble to inquire into this subject, but go on from year to year cleaning out their retorts, simply because it is the custom to do so in other places, and has been in theirs; and if I may be permitted so to say—this practice of carrying the corn to the mill in the manner of our forefathers, is too prevalent in some gas works at the present time.

The cause of the deposit of carbon in heated retorts is attributable to the fact, that when bituminous coal is subjected to destructive distillation by heat, it yields a great variety of vapors, and gases composed chemically of carbon and hydrogen; and having each one its particular condensing temperature, or degree of heat at which it changes from the aeriform to the liquid state, some of these having so low a condensing temperature that they remain gaseous when exposed to intense cold, while others require a considerable elevation of temperature, to cause them to assume rapidly the condition of a gas; but there is another agency beside heat that can produce the condensation of these aeriform bodies, or make the liquid ones take on gaseous state, the temperature being the same; and this agency is mechanical pressure, and therefore these two agencies—heat and pressure—may cooperate, or antagonize one another.

The greater the pressure under which distillation takes place, the greater degree of heat will be required to effect the vaporization; and conversely, the gaseous condition can be produced at a lower temperature, by lowering the pressure in the retorts.

If the volatile fluid and solid substances produced by distilling coal were placed in a pure state, or unmixed with other bodies in a retort, and heated properly, they would distil over and leave no residue in the retort; but if they were intimately mixed with some poor conductor of heat like clay, and then subjected in a retort to a quick action of the fire, some parts of the mass would become much more highly heated than others; the portion in contact with the retort, and the vapors from this part tend to be disengaged, but as these vapors would meet with great pressure from the superincumbent and comparatively cool part of the mixture, they would tend to be recondensed and some only would escape.

The temperature still rising, a change would at length occur from this cause, and in the chemical affinities of the molecules of the volatile bodies, and new combinations would take place, in which a portion of the carbon—as that constituent which has the greatest tendency to be fixed—would separate and remain chemically uncombined, thoroughly disseminated intimately in a mechanical way among the particles of clay. Now, if the pressure in the retort and the heat should be sufficient, exactly what takes place in the interior of the mass would take place at the sides of the retort, where the vapors in a greater or less condition of rarity come in contact with the heated surface. The chemical affinities would be changed under the influence of the heat. New combinations would occur in which, by the law of definite proportions, fewer atoms of carbon would be required; and the superabundant atoms of carbon would then be deposited in a state of great purity and close aggregation.

The volatile compounds of hydrogen and carbon in coal are the only portion yielding gas, capable of giving light when burnt. Now it is well known that when the coal or any similar organic matter is distilled under a low heat, that the carbon has a disposition to pass o8 with little hydrogen. This gas will be rich in carbon, but as the temperature rises the liquid carbide of hydrogen diminishes in quantity and the gaseous carbide of hydrogen increases. And as the heat goes on to increase, the hydrogen continues to increase, and the carbon to diminish; or, the gas becomes richer in hydrogen and poorer in carbon. It is evident, therefore, that the deposit of carbon is caused by the combined agency of heat and mechanical pressure, the latter being the most powerful of the two.

It is well known to many persons here, that in 1867 I contrived a means to prevent to as great an extent as possible the deposit of carbon in retorts. This is known as "McIlhenny's Vacuum Process." Previous to this I, like many others that were trying to make the retorts and coal yield good results, had a great deal of trouble from the accumulation of carbon. And knowing that successful experiments had been made by reducing the depth of the seal on the dip-pipes, I came to the conclusion that if the retorts could be worked without the *seal*, but very little carbon

would be deposited. The theory on this subject to me is a very simple one, because it is manifest that if the gas can be removed whilst it remains in a state of vaporization, the carbon cannot be separated from the hydrogen. And it is a well-known law of organic chemistry, that the higher the temperature and the more advanced the decomposition of the substances, the simpler are the products. The affinity between the carbon and hydrogen seems to diminish. It would then be the natural tendency of the carbon to adhere to the heated surface of the retorts; but if the whole mass is removed before any separation takes place very little will stick. In order, therefore to remove all obstructions from a free flow of this mass of vapors, it is necessary to have the mouths of the dip-pipes perfectly free from obstruct on.

Clegg says in his fourth edition, page 38, "That it is evident that the value of the gaseous and liquid hydrocarbons as light yielding materials, is in direct proportion to the quantity of carbon contained in a given volume. The densest of the gases or vapors are therefore those which possess the highest illuminating power." All the members of this class, however, as just mentioned, are more or less rapidly decomposed at a red heat, and in the usual process of gas making, the inner walls of the retorts soon become covered with a layer of carbon derived from this source.

This destruction of luminiferous constituents is dependent, on the one hand, on the length of time during which they are exposed to a high temperature, and on the other upon the number of the particles of such constituents which come in contact with the red hot sides of the retorts.

Two methods therefore suggest themselves for the prevention of this decomposition. The first would consist of the rapid removal of the gases from the retort, and the second in the dilution of the luminous by an admixture of non-luminous constituents, for it is evident that the number of atoms of illuminating gas, in contact with a given surface, would only be half as great if that gas were diluted with an equal volume of hydrogen, as it would be without such mixture.

In speaking further on this theory, I am satisfied, and it must be apparent to any one having examined the subject, that the actual and immediate cause for the deposit of carbon in retorts, is mechanical pressure; and when that is entirely removed, but very little if any carbon will adhere. When distillation first takes place on the inside of the retort, the vapors are in a heavy black mass, containing all the volatile portion of the coal. And this vapor is at a low degree of temperature, and only separates as the mass becomes more highly heated. And in this condition the atoms of carbon become condensed, and many of them adhere to the heated walls of the retort, and of course become separated ftom the mass of vapors. Now, it must be evident that if this entire mass were at once and immediately removed, and passed in the ordinary way to the holder, those atoms of carbon would be carried by the volume of hydrogen and become an illuminating agent, instead of sticking to the inside of the retorts; and when it is considered that the value of the gas for giving light is in exact proportion to the amount of carbon it contains, this matter will be appreciated.

When clay retorts were first introduced, the great difficulty in their use appeared to be the amount of carbon that accumulated, because of the greater heat under which they were worked. Owing to this fact, Mr. Grafton, at the Cambridge (England) works commenced a series of experiments to ascertain the cause of the vast accumulation of carbon, and without going into all the details of his experiments I will simply give the results: From 67 tons of coal 10 cwt. 24 lbs. of carbon was taken out, or 1 2-10ths per cent. of the weight of the coal carbonized. This was under a pressure; but when he reduced that pressure he found the amount of carbon was very much decreased.

Mr. Smedberg has written me on this subject, and I do not consider his any mean authority. I think, therefore, that it is unnecessary for me to go any further to prove this theory, as I am sure that every intelligent gas engineer will admit it. I will now give you what has been my own experience under the operations of the "Vacuum Process."

The growth of carbon inside of retorts forms an interesting study, and doubtless there are those present who have watched its formation with interest. Although the atoms are not visible to the eye, yet the formation can be seen to increase from week to week; and if allowed to go on without being removed, it will entirely choke up the retort. The formation is continuous, but the quantity in the retorts is entirely dependent on the frequency of its removal. I have seen it on all sides and top of the retort, and hanging from the roof like rocks from a cliff. It was my custom before the use of my process, to clean out the retorts about every five weeks, but then the retort was very much impaired; two weeks before, and often several days after, leaky, so that I calculated that about three weeks embraced the entire time when the retort had its full capacity.

Now, in working the retorts with the "Vacuum Process," I make it a rule to clean them out every three months, but then there is less carbon than there would be under a pressure in three weeks. No carbon whatever collects on the roof of the retort, nor on the sides, nor in fact any part of it where the coal does not lie.

The exposed part is just as clean as the day the retort was fired up. It collects in the corners, and increases in thickness towards the back; this is owing to the fact that the vapors cannot get away as rapidly as where the coal does not lie, consequently become decomposed. The carbon adheres to the retort, but in my opinion if there was no obstruction such as the coal is, no carbon of any account would remain. If there was no advantage derived from the use of this method of working retorts, other than the prevention of the formation of carbon, it is of great value, in a monetary sense, as well as facilitating the operations of the retort house.

What would be the feeling of relief to every manager of a gas works, if he knew he could go on and charge his retorts from the time he set them until they were burned out. It having been fully demonstrated that retorts can be run from three to six months without cleaning, thus putting within the reach of every superintendent of a gas works, the facility of having to clean out retorts from two to three times a year only, instead of ten times, as is mostly the case now.

I do not deny that the general management of a gas works may not have something to do with this subject. In fact, I think that many companies make a grave mistake when they suppose that any man who can throw coal into, and draw coke out of retorts, understands the manipulations of the materials in the manufacture of illuminating gas.

Indeed, under this delusion, a great many companies are suffering heavy loss; and some large companies, hundreds of thousands of dollars per annum. In addition to the prevention of the formation of carbon, there is a very important advantage in the increased yield from the coal. This of course will be increased just in proportion to the yield under the *pressure* system.

We will take for example Penn coal, and admit that the company gets 4 40 100th cubic feet per pound of coal: now if that yield can be increased to 4 80-100th cubic feet, and the company carbonizes 50,000 tons of coal per annum, the difference will be 44,800,000 cubic feet; or if the company uses 25,000 tons of coal then the increase will be 22,400,000 cubic feet. But now, suppose the yield to be only 4 cubic feet per pound, then the difference to the company using the 50,000 tons of coal would be 89,600,000, and the company using 25,000 tons, 49,800,000 cubic feet. And so this scale goes up or down just in proportion to the amount of coal carbonized; assuming all the time that the gas be the same, or as good in quality. You will perceive, therefore, that these figures are indeed startling, but nevertheless true.

I snppose there are some present who have often wondered why it is that there is such a vast difference in the results of gas companies using the same materials, but such is the fact there is a great difference. Now there ought not to be much difference, because the same facilities are at the command of all.

It is true, however, that the same appreciation of the necessity of making high efforts to be at the top, and taking advantage of all the circumstances that contribute thereto, are not always realized alike. Nor is it to be supposed that all have equal abilities any more than in other professions; but notwithstanding these facts, there should not exist the differences that now do, in the results of the various companies.

You will perceive that the saving does not end with the decrease in the quantity of carbon deposited inside the retorts, nor the increase of yield from the coal, but extends to all the incidental expenses of the retort house; and this saving is in exact proportion to the increased yield from the coal and retorts.

It will doubtless be asked if there is not some difficulty in working successfully under this process; and in response I will say, that all that is necessary is to thoroughly understand the principle and the means of carrying it out—and there can be no doubt of success. But I will admit that it is necessary to fully comprehend these points; but then it is to be presumed that every, or nearly every gas engineer fully understands these principles, and the mode of carrying them out. All the difficulties that encounter one in the use of this method are mechanical, and therefore easily overcome if properly understood.

I am often asked if the exhauster has not to be carefully run. Yes, if the means of controlling its actions are not perfect, or nearly so. Now, with me there is no difficulty in this respect, because I have a governor that has perfect control over the engine, and when this is obtained (which is easily done), there is no more difficulty or risk than there is in the old system.

If coal continues to be the material from which gas is made, I am satisfied that it will not be many years before this system is in general use.

On motion of Mr. White, the convention tendered a vote of thanks to Mr. McIlhenny for his address.

[To be continued.]

Important Coal Injunction.

Judge Dana, at Wilkesbarre, has granted a preliminary injunction in an action brought by the Pennsylvania Coal Company against Thomas Waddell and J. P. Schooley, Jr., restraining them from mining operations within thirteen feet of the bed of the river, making it possible for the water to break through, and in case this should happen not only the mine in question would be liable to inundation but a number of others owned by the company would be placed in the same danger. It is also claimed that they are mining upon the company's property. The question of mining the coal from underneath the river has special interest attached to it. It creates danger to many acres of property already opened and worked, in the way of inundation, which would compel the abandonment of numerous mines which are now lucrative. On the other hand, if it proves impossible to go further in this direction much coal will be lost, and the vast tracts of coal land on the opposite side of the river cannot in this way be reached, which will interfere greatly with projects which several coal operators hope to consummate, there being an advantage in taking the coal from that side, which on the Kingston and West Pittston sides cannot be enjoyed.- *Coal and Iron Record.*

Scottish Gas Item.—Dr. Wallace has been demonstrating to the people of Glasgow how that paying a high price, 5s. per 1000 cubic feet, for gas of 26 candles, is more economical than being served with gas, as at Manchester and Birmingham, of 20 or 15 candles at 3s. 8d. or 3s. 6d. Very much saving could be effected by properly using efficient burners. Bronner's burner was specially commended.

Chemical Repertory.

No. 113.—June 2, 1874.

EDITOR—HENRY WURTZ.

CHEMICAL EXCERPTS.

1127. Ammonia from Gas.—Ammoniacal liquor, in 1872 brought £69,448 to the London companies. Ammonia has become an agricultural want—a necessity in fact; and if, as now seems certain, the exhaustion of the ammoniacal guano deposits is imminent, our gas liquor will rapidly rise in value. Recent improvements in our means of eliminating ammonia from gas leave nothing to be desired, while the cheap and simple form of apparatus by means of which the liquor can be converted into a marketable product offers to the smallest gas company the opportunity of making money by what was once a waste product.—*London Journal of Gas-Lighting.*

1128. British Gas-Patent.—W. A. Valom, Isle of Thanet Gas Works, Ramsgate, Kent.—The invention consist in arranging the hydraulic main which is constructed with a water trough on its top, so that the ascension pipe shall enter its bottom. Directly over each ascension pipe a hole is formed in the top of the hydraulic, and around the hole a short upright pipe or cylinder is attached. A cap or cover is made to pass over this pipe and dip into the water in the trough. Fixed to the top of the interior of the cap is a pipe of such size as to admit of its passing freely through the short upright pipe and over the ascension pipe into the liquid contained in the hydraulic main. An effective seal is thus made. When the retort is charged the operator pulls a rod or chain passing over a pulley or attached to a lever, which raises the cap and attendant pipe; the seal or dip is thus broken, and the gas allowed to flow freely into the hydraulic. The cap, however, is not raised sufficiently high to break its seal or water lute, so that no gas can escape from the hydraulic except through its appropriate channel. The cap is provided with a hole and cover.

1129. Dr. Wallace, on Gas.—At a meeting of the Sanitary and Social Economy section of the Glasgow Philosophical Society, Dr. Wallace recapitulated the chief points of a paper previously read by him on "The Economic Cumbustion of Coal Gas." In the course of a discussion the doctor said that if we had means of reducing the pressure of gas the kind of burner used was of less consequence. Almost any kind would answer except the rat-tail burner. He strongly advised consumers to use regulators attached to meters. Having reduced the pressure to a proper extent, the next thing to consider was a suitable burner. If a stuffed burner was used, such as Bray's or Leoni's, the pressure would require to be not less than 9-10ths of an inch on the water-gauge; without stuffing it should be about 6-10ths. The stuffed burner possessed another recommendation, which was that it often prevented the specks of dust getting into the orifice of the burner. The objection to iron burners was that they rust and become irregular in size.—*Iron.*

1130. The School of Mines.—For some weeks past a large gang of men have been engaged in tearing down the buildings occupied by the School of Mines of Columbia College, and clearing the space preparatory to the erection of a number of buildings more specially designed and adapted to the present demands of the classes comprising the school. The new buildings, designed by C. C. Haight, architect, are to be of brick, with granite trimmings, heavily constructed to prevent the annoying jar heretofore felt on the passage of railroad trains from the Grand Central Depot. The general effect looking from the college green will be that of the "quadrangle" in some of the older English colleges. The accommodations in the new building will include spacious lecture-rooms, chemical, geological, and paleontological museums, with separate apartments expressly intended for the assay, qualitative analysis, quantitative analysis, and drawing departments. The Board of Trustees have appropriated $150,000 as a repair fund. This will defray the expense of the new school, and also the repainting of the old college building proper. The fall session os the mining school opens on October 6, at which time the alterations will be complete.

1131. New Gas-Burner.—The news of the invention of a burner, which will give, with the same gas, 20 per cent. more light than Sugg's London Argand, will come with some surprise on the gas world, and justify the careful parliamentary agents who have added the words. "or other approved burner," after specifying a particular burner in the section relating to the testing of gas. We have, at present, no special information on the subject, and have been, as yet, unable to procure a specimen burner; but we have the assurance of Mr. Valentin, a most competent and careful experimenter, who testifies to the results we have mentioned above. The burner is the invention of Mr. Silber, the inventor of the Silber lamp, and it is to be placed on the market as soon as many thousands have been manufactured to supply the anticipated demand. As soon as possible, a complete description of the burner, and the results realized by its use, will be given in our columns.—*London Journal of Gas-Lighting.*

1132. American Pencils.—Seven years of patient study have resulted in the invention of a series of machines by which American lead pencils are made, in Jersey City, entirely by machinery. From the time the plumbago and rough strips of cedar and other woods enter the machinery, until they are turned out together polished lead pencils, ready to be tied up in packages, no hand labor is required. The materials used are all American, the plumbago coming from the town of Ticonderoga, New York, and the cedar from Florida. The pencils are made of five different grades, and they are said to be of such a quality that they can compete at once with the best pencils of German manufacture. If such should prove to be the case, American pencils will have no difficulty in finding a market, for the process by which they are manufactured is the cheapest in the world.

1133. Water-Pollution.—In nearly all branches of textile industries, there are quantities of oily and soapy liquors allowed to run to waste which poison or injure the waters of the canals or streams into which they are allowed to flow, or which gradually filter through the soil to neighboring wells, or run into sinks or cesspools in closely-populated neighborhoods. There are two important reasons for attempting to utilise these liquors—the one sanitary, the other pecuniary. Experiments made in Cologne prove that neither fish nor frogs can live in streams thus polluted. The fatty acids combine with earthy salts in the water to form insoluble soaps and slimy scum, which give off unpleasant odors and injuriout gases. To prevent these evil consequences, Dr. Wohl suggests the treatment of these liquors with slaked lime, whereby all the fatty acids are precipitated as lime soaps. These soaps will find a ready sale at such establishlishments as prepare the fatty acids, or reconvert them into other soaps. Instead of lime, magnesia might be employed, which can be decomposed by sulphuric acid without forming an insoluble precipitate, as is the case with lime. Either the lime or magnesia soap may be employed for the manufacture of illuminating gas, of which they will be found to yield a large quantity of excellent quality.—*Iron.*

1134. Gas and Soil.—Remarkable testimony as to the permeability of the ground, and of the foundations of our houses, has been given by gas emanations into houses which had no gas laid on. I know cases where persons were poisoned and killed by gas which had to travel for twenty feet under the street, and then through the foundations, cellar-vaults, and flooring of the ground-floor rooms. As these kinds of accidents happened only in winter, they have been brought forward as a proof that the frozen soil did not allow the gas to escape straight upwards, but drove it into the house. I have told you already why I take frozen soil to be not more air-tight than when not frozen. In such cases the penetration of gas into the houses is facilitated by the current in the ground-air caused by the house. The house being warmer inside than the external air, acts like a heated chimney on its surroundings, and chiefly on the ground upon which it stands and the air therein, which we will call the ground-air.—*Sanitarian.*

1135. The Danger of "a Little Knowledge."—From the *Technologist* we learn that the *Northwestern Review*, in an article upon "Illuminating Oil and Fires," remarks as follows: "It should be borne in mind that the oil never explodes; it is always the gas which is given off the oil. When the people understand this, they can then prepare against the danger. One simple method is to permit all gas that has accumulated during the day to escape before lighting the lamp in the evening. This can easily be done by loosening the burner for a few moments. The gas, being lighter than the air will escape at once."

[These people may be surprised to learn that the "gas which is given off" by rectified petroleums, of the dangerous species, far from "being lighter than air," is often *much heavier*. Hence, in fact, the most of the danger of handling petroleum containing volatile ingredients, or the so-called gasoline. When such ignorance is entertained by those who should be teachers of the people, what wonder that the latter do not find it worth while to be taught, and continue to "go it blind" in such matters.—Ed.]

[Original Communication.]

Coal Gas Illumination in London in 1805.

By Prof. B. Silliman.

Mr. Newbigging, in his valuable Handbook for Gas Engineers and Managers, London, 1870, page 159, gives a "Chronology of Gas-Lighting." By this author's statement the first public exhibition of gas in London was in 1807, by Mr. Winsor, who lighted Pall Mall at that time. This is no doubt correct, so far as Mr. Winsor is concerned; but there was a public exhibition of illuminating gas from coal in London in 1805, an account of which will be found in "A Journal of Travels in England, Holland and Scotland" in 1805, by the elder Professor Silliman, vol. 1, p. 244 (8 vo. edition, 1810). The passage may be interesting to some of your readers, Mr. Editor, and is as follows:

"ILLUMINATION WITH GAS,

(1805, July 4). "I had been with a companion into Hyde Park, to see the Serpentine Canal, and the flock of swans which are suffered to swim unmolested upon it, when, on our return through Picadilly, we were induced to stop, near Albany House, by an object of some curiosity.

"An ingenious apothecary and chemist has contrived to light his shop in a very beautiful manner, by means of the inflammable gas obtained from fossil coal. It is the same thing with the thermo-lamp, of which you have heard much in America. Every new thing by which money can be made, is of course kept secret in London, as well as everywhere else. I took the liberty, however, of asking the owner of the shop to permit me to see his apparatus. He refused at first, but on my assuring him I was not a commercial or trading man, and was actuated solely by curiosity, he consented, and took me down cellar.

"The inflammable gas is extricated simply by heating common fossil coal in a furnace, with a proper apparatus to prevent the escape of the gas, and to conduct it into a large vessel of water, which condenses the bituminous matter resembling tar, and several other products of the distillation that are foreign to the principal object. The gas being thus washed and purified, is allowed to ascend through a main tube, and is then distributed by means of other tubes concealed in the structure of the room, and branching off in every desired direction, till, at last, they communicate with sconces along the walls, and with chande-

liers depending from the roof, in such a manner that the gas issues in streams from orifices situated where the candles are commonly placed. Then it is set on fire, and forms very beautiful jets of flame, of great brilliancy; and from their being numerous, long, and pointed, and waving with every breath of air, they have an effect almost magical, and seem as if endowed with a kind of animation.

"The gas is sometimes made to escape in revolving jets, when it forms circles of flame—and, in short, there is no end to the variety of forms which ingenuity and fancy may give to this brilliant invention.

"I was assured that they found this mode of lighting the shop more economical than the common one with oil or candles. But it is not so well adapted to small and confined apartments, as there is an odor resembling that which arises from burning coal; this odor may be prevented by peculiar precautions, but it is apt to exist, and this renders ventilation necessary.

"The expense of the apparatus, and its liability to accidents, forms another obstacle of magnitude, and, on the whole, it is probable it will not be generally adopted."

This is curious reading in 1874! It is true as Prof. S. indicates that as a private enterprise, in private houses, it has never been adopted—and never will be. How far the public mind was then from being educated up to an understanding of the problem of gas manufacturing, by corporations, for general use, is seen in the refusal of the Parliament of Great Britain, in 1808 and 1809, to grant charters to Mr. Winsor, and the National Light and Heat Company, for the manufacture and distribution of gas.

In his "Reminiscences," written towards the close of his life, Prof. Silliman again alludes to this subject (Life of B. Silliman, by Geo. P. Fisher, 1866, p. 145, vol. 1) and says:

"The first illumination by gas in London, took place in the summer of 1805, and it was my good fortune to see this exhibition on the evening of July 4th of that year," and then he rehearses the facts substantially as above given. Mr. Murdock had employed gas illumination in 1792, and gas was used in Paris in 1802. But London was in the dark until 1805. Who the enterprising apothecary of Albany House was, Prof. Silliman does not say. His name ought not to be forgotten.

Another Gas-Lyric.

NOTE BY EDITOR.—Marcus Smith, Esq., Sup't of the Wilkesbarre Gas Company, sends the following, which, he says, "no doubt will amuse your readers"; and which he therefore desires we shall put into "the column we have devoted to poetry." We have already, on a former occasion, pointed out that our columns may be said to be largely devoted to *light literature*, and therefore such *morceaux* as this would seem not wholly inappropriate. Mr. Smith's idea of a "goak" is rather curious: but it is nevertheless possible we may have readers whom it will "amuse" to regard the hero of the poem as *gas*ping his last. This outpouring may be intitulated

The Gas Man's Career.

HIS LIFE.

Don't envy the life of a gas man,
In spite of his plunder and pelf,
Forever blown up by the public,
And often blown up by himself.

A common man blesses the sunshine,
Delighted with beautiful day;
But the the bloated and horrible gas man
Despises whatever don't pay.

All nature to him is but business,
The sun doth a gas tank appear;
The very stars nothing but burners,
And the moon but a big chandelier.

Whatever rejoices his fellows,
Is only coal ashes and soot;
Unless in the order of business
It fetches him so much a foot.

A satrap, he governs our pockets,
Our houses, our shops and our rights;
The doctors may fuss with our livers,
But he must have charge of our lights.

I read in the life of a gas man,
The lessons such people can teach,
Prophetic of brimstone and blazes,
As plain as a parson can preach.

HIS DEATH.

How dreadful the death of a gas man,
Surrounded and haunted by those
Whom his plundering charges have swindled
Till conscience forbids him repose.

Oh! solemn and awful his passage,
With the implements gathered around
Wherewith he has ruined his neighbors,
And lit his own home underground.

The coal and the coke and bitumen,
The acids, the tar and the steam,
The sulphur, the lime and foul odors
All thronging his terrible dream.

Detestable stenches surround him,
Fierce demons on gas pipes appear,
False meters arise and confound him,
And patent jets hiss in his ear.

If he kicks, both his feet must remind him
Of the feet overcharged in his bill;
While the tick of the clock, like a meter,
Each second must give him a thrill.

HEREAFTER.

At length, when his oxygen fails him,
He sinks with the folks of his sort,
When the devil immediately grabs him
And places him in a retort.

Correspondence.

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—ED.

Strange Occurrence.

ZANESVILLE, OHIO, May 21, 1874.

Mr. Editor: On tearing down two of our old benches that have been in use some twenty years, we find behind the fire-box and some fifteen inches below the fire bed, that the brick foundation of the floor has been converted into one solid mass of black glass, or something else, like the sample enclosed. The melting of the bricks into one solid mass is common, but in all my experience I never saw anything like this. I will also state one fact that may have had something to do in the coloring of the material; the stay rods (iron) some ten feet long and two inches diameter were completely burned up; not a particle is left but the outside ends. Believing this to be an unusual occurrence, I take the liberty of giving the facts, and enclosing a specimen. Truly yours,

A. C. ROSS.
President Zanesville Gas-Light Co.

Suppression of Sewer Gas.

Iron gives the following account of a new apparatus, known as the Redcliffe Sanitary and Ventilating Trap. Composed of stoneware, glazed inside and out, it is not liable to corrosion, which is a palpable advantage. Its shape being that of a very large-sized egg, it admits of no projecting corners to prevent the free passage of any matter going through it to the sewer. It holds about four gallons of water (more than any of its rivals); its diaphragm dips three inches into the water and is hermetically sealed to the underside of the top, so forming a powerful resistance against sewer gas passing that point. The internal conducting pipe which is connected with the soil-pipe from the closets, etc., above, bends undef and discharges its contents into the body of water in the trap well below, and beyond the diaphragm on the sewer side, to prevent soil or gas re-entering the soil-pipe and escaping thence to the house. There is also an excellent arrangement in the crown of the trap for complete ventilation through a distinct pipe which is carried to the top of each house, and which has only that function to perform.

A second inlet, also trapped, takes the waste water from baths, sinks, etc., thereby thoroughly cleansing the apparatus, arresting smells of every description from passing into those parts of the house, or into the waste pipes from cisterns, and, in fact, completely checking the inroads of sewer gas. The trap is moderate in price and is easy of application to existing systems.

Fall of a Gas Works Roof.—We learn from the Mobile *Daily Graphic* of May 2nd, that the iron roof of the new works of the New Orleans Gas Company, fell in with a crash last Thursday evening, injuring four men.

PRICES OF FOREIGN AND DOMESTIC GAS COALS.

[Reported Expressly for this Journal.]

June 2, 1874.

DELIVERED IN NEW YORK.

English Cannel.			
Ince Hall	$17 00	@	18 00
Kirkless Hall	16 50	@	17 00
English Caking Coals.			
Newcastle Gas	$12 00	@	00 00
Liverpool caking	11 50	@	12 00
British Province Coals.			
International—At Sydney, $2 50 in gold			— —
Block House—At Mines, $2 50, Gold			0 00
Little Glace Bay—At Mines, 2 50 Gold			— —
Pennsylvania Coals.			
Penn Gas Coal—At Amboy	$7 00	@	0 00
Westmoreland—At Amboy	7 00	@	0 00
(In New York both the above coals $7 50)			
Shafton	7 50	@	0 00
Youghiogheny	7 75	@	0 00
West Virginia Coals.			
MurphyRun	$7 40	@	0 00
Despard	7 40	@	0 00
West Fairmont	7 40	@	0 00
American Gas Coal	7 40	@	0 00
Fairmont	7 40	@	0 00
Newburgh Orrel	7 40	@	0 00
Pinnickinick	7 40	@	0 00
Cloverhill of Virginia	6 00	@	6 50
McKenzie Compound Mixture			— —
American Cannel Coals.			
Peytona of West Virginia	$12 50	@	00 00
Darlington of Pennsylvania			— —
Cannelton Cannel			12 50
Asphalts.			
Albertite of New Brunswick	$— 00	@	— 00
Ritchie Mineral of West Virginia	18 00	at	Balt'e.
Trinidad Bitumen	— —	@	14 05

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" " " with 2 reflectors	" " "	5.05
"Street" size, *plain style*, globe 10 x 16,	" "	5.00
" " with 2 reflectors	" "	7.50
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☞ All communications to be addressed to **"The Proprietors,"** No. 42 Pine Street, Room 18, New York.

TUESDAY, JUNE 2, 1874.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

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GAS-LIGHT ASSOCIATION OF THE UNITED STATES.

In the present number of the Journal is given a second instalment of the proceedings of this body, late in session at Cleveland, Ohio. It will will be remembered that we procured for our last issue of May 16th, the address of the acting President, Mr. Price of Cleveland, with which the session was opened, May 13th.

It will be observed that the progress of this movement, initiated but one year since, is very satisfactory. Nearly 60 gentlemen are recorded as present at the opening enrollment, comprising a wide-spread representation of the profession in America. There were, among these, five representatives of New England, twelve of New York, others from as far south as Georgia and South Carolina, as far west as Iowa, Minnesota, Wisconsin and even California, and as far north as Canada, from which latter no less than three representatives of prominent cities were present. Doubtless many others of the profession attended the meeting whose names have not been sent us.

We observe that the report is verbatim, to all appearance; in fact, some may think, unnecessarily so. Undoubtedly there will be those who would have preferred the omission of some portions of the discussion, upon points irrelevant to the business in hand. On this individually we have nothing to say, except that of course we had no shadow of right to alter or excise any portion of the stenographer's notes, at least without authority from the Secretary of the Association, with whom we have had no opportunity to advise.

There are other portions, however, of the discussion with which this session of the association opened, which, to our mind, convey an import, indeed a grave significance, which will not strike all readers at first glance, but which appears to us to call for some emphatic comment. We refer to the very first question that arose, and to the very remarks made by the gentleman who raised that first question, Gen. Hickenlooper, Vice-President of the Cincinnati Gas-Light and Coke Company. The remarks of this gentleman went to the root of the matter, and it is to be regretted that the discussion did not go further and elicit a wider expression of opinion.

Mr. Price speaks of the trouble that had repeatedly arisen in the previous discussions upon a national organization, relative to the constituency of such an organization. He says that on the whole it was thought best so to organize as to include the "financial and managing talent of gas companies," instead of confining the membership to those directly interested only in the science and the technicalities of gas-making. Well do we remember the disputes—we may add, the dissensions—which arose out of this view, we ourselves having been at first among the dissenters, who were, however, too few to carry their point, and most of whom gave way, as gracefully as they might, to the opinion of the majority. We can but speak for ourselves, in saying that our own belief was, and still is, that it would inevitably be all the same in the end, and that practically the working of *any* association, however founded, would be for good, and would be virtually confined to those who want to get and to impart knowledge, either as an end, or, at least, as a means.

The occasion was one not to be sacrificed, to establish a nucleus, at least—a standard, so to speak, around which the profession might rally; a bond of union, which might then be strengthened by individual efforts; in case the latter were forthcoming.

That standard was raised, and as yet there is no indication of its abandonment. Which *cause* it is to represent—whether that of Science or that of Finance—may by some be regarded as still unsettled; but we have already pointed (in our editorial remarks, in the last issue) to Mr. Price's opening address, as affording a good augury that the former cause, that of Science—involving the greatest good to the greatest number, to the multitude and not merely to the few; the genius of the future, and not the mere winged phantom of the present—will preside over the Gas Light Association of America. We cannot believe that there can be any other result; for any other would be so lame and impotent, so much at variance with the spirit of the age, and so destitute of inherent cohesive power, that its uselessness would soon become apparent to the narrowest intellect.

Another development from this meeting of the Association, we judge, is the abandonment of the idea that was broached at the last October meeting here, and received with much favor by the men from the west—to abandon the *national* organization, and merge the movement into a sectional one, confined to the western states, after the fashion of the New England Association. We repeat that we judge this idea to have been dropped, from the fact that the next meeting, in October of this year, is to be held in New York again.

Regarding the two papers read at the late meeting, which we present in full in this issue; it may fairly be said that the essay of Mr. Steele is a just statement of the general case of the gas manufacturer, in his relations to the public, and that his advice to his professional brethren, upon their true mode of dealing with that public, cannot be too highly commended. As to the treatise of Mr. McIlhenny, though there may be some who will differ from him in his way of putting the theory of the matter, there can be no doubt of the actual practical value of the results of his work; as we ourselves know from personal observation and examination; and, indeed, we have before expressed so strongly our own views of the worth and merit of Mr. McIlhenny's methods of operating, that it would be superfluous to say more here.

A PHILADELPHIA GAS-WAR.

Some of our readers will know more about this subject than we do, as yet. To others, however, will doubtless be news to hear that a quite bitter contest is now in progress in Philadelphia, which when we obtain the full record, which we as yet have not—may furnish an interesting contribution to the literature of "municipal gas."

The only document we have, up to this, came to our hands in a pile (somewhat "mountainous," as the miners say) of exchanges, from which the wrappers having been removed, we are in the dark regarding the source. It is entitled "Second Report to the Citizens Municipal Reform Association, on the Philadelphia Gas Trust"; is dated "Rooms of the Executive Committee, No. 711 Sansom street, Philadelphia, May 18, 1874," and is signed "Henry C. Lea, Committee." Steps will at once be taken to procure the whole history of this case, and an endeavor on our part also to hear *both sides*. At present we can but say that some of the allegations that appear to have been brought against the Management of the Corporation gas works, by the Citizens' Association, are quite serious in character, and we cannot but hope, and indeed

believe that they must be largely based on exaggeration and misunderstanding. It is asserted, for example, that the gas unaccounted for in one year (1872), at the selling price, footed up over $455,000; that the street-lamps cost $55·50 per annum each, their consumption of gas being estimated at *eight feet per hour*, and many other strange assertions of the like disparaging kind. More of this matter, doubtless, at a future day.

GAS AND GUANO.

The connection between these two topics—though not obvious, and not very direct, we must confess—is nevertheless not without interest, as we look at it. Within a few weeks, news has come that new discoveries of guano have been made and confirmed, on the main land of South Peru, to the amount of eight millions of tons. This fact is regarded as of national importance, on account of the enormous income to the people here represented, and because a small export duty per ton on this material will furnish a living revenue to the Peruvian government.

Now the bearings of this fact on gas matters, lie, as Jack Bunsby says, "in the applications on it." The most valuable constituent of this eight million tons of guano is its ammonia, which it holds to the extent of say a million and a half tons. The phosphates, it is true, have their value, but these can be had everywhere. Our present object is briefly to point out that we have, in our gas works, at our very doors, a source of ammonia, which might be used for fertilizing purposes, and largely displace this guano that is brought thousands of miles—a source which is with trifling exceptions, almost neglected and allowed to run to waste. We do not hesitate to assert that in a very few years, all the ammoniacal compounds in fertilizing composts from which market-produce is grown for our cities, will be furnished by the gas works of those cities. Say that guano contains 20 per cent. of ammonia, and gas-coal is susceptible of yielding but one per cent., the ammonia obtainable from the 400,000 tons of gas-coal consumed annually by the two millions of population within a few miles radius from the New York City Hall, would be 4,000 tons per year, or equal—*in this respect*—to a supply of 20,000 tons of guano yearly. More anon on this momentous topic.

ERRONEOUS FIGURES.

In our last issue was inserted a tabular statement, credited to Mr. Cathels, of Montreal (extracted from an official report of this gentleman to his Company) purporting to give comparative prices of gas in some American and Canadian cities. A letter just received from Mr. Bailey, the Secretary of the Washington, District of Columbia, Gas-Light Company, calls our attention to the fact that, whereas Mr. Cathels records that company as charging $3·56 per thousand, their charge is in reality but $3. Mr. Bailey has had the kindness to transmit to us, at the same time, a copy of a valuable document, being a list of no less than 437 companies throughout the United States, whose prices for gas that company has ascertained by direct inquiry. This document we propose to make large use of. At present it is proper that we indicate such others of the figures of Mr. Cathels as are in error to any important extent. They are not numerous. Albany should be 3·25, instead of $2·50; St. Louis, $3·09, instead of $3·25; Troy, $3·50, instead of $3·25.

Mr. Cathels's other figures for American towns are correct, and his figures for the Canadian cities, Hamilton, Kingston, London, Toronto, Montreal and Quebec, which are doubtless trustworthy, form a valuable addendum to those of the Washington Gas-Light Company; and should be preserved, or made a note of, by those who are interested or curious in this sort of statsitics.

A NEW PENNSYLVANIA GEOLOGICAL SURVEY.

The late legislature of Pennsylvania appears to have been induced, after much tribulation, to take a fresh start in a work which should never have been intermitted; namely, the continuation of exploration and mapping the geological structure and mineral contents of the Keystone State. The arguments brought to bear against the undertaking, by those terrible fellows yclept (by themselves) "practical men," had neither more nor less absurdity, stupidity, and plausibility, than usual; so we will let them drop into oblivion, until the next time.

A Board of ten Commissioners was created, to organize this new Survey, including very distinguished names, and we trust—and indeed we entertain no doubt—that they will at once put the work entirely under the control of the one man whose antecedents, claims, natural and acquired fitness, and special attainments, mark him as *the* man for this work. We refer to Professor J. P. Lesley. The appropriation made is something over $100,000 for three years work. This is not too liberal; but, no doubt, in the hands we speak of, even this will be an investment that will remunerate the Commonwealth of Pennsylvania one hundred fold. Other appropriations may follow, and no doubt would do so, when the people had seen what Professor Lesley would surely accomplish with this.

The new and systematic knowledge of the Appalachian coal field—that most wonderful of all treasuries of the wealth of Nature—that Professor Lesley would surely bring together, would be a legacy, not to his State alone, but to the Nation itself, would justify the laying out of a far larger sum than this.

A NEW AND INTERESTING BIT OF HISTORY.

Our readers owe to Professor Silliman a valuable historical contribution to this issue of the Journal, which will be found on another page. Professor S. has discovered that his father, of illustrious memory, witnessed and put on record, in one of his published works, a public exhibition in London, of the use of gas made from coal for lighting up a public shop, antedating by two years the earliest otherwise recorded case. This suggests the probability that still other cases then existed, of experimenters in the same field, who never went on the record at all, and we have another exemplification of the very general truth that inventions are seldom, if ever, wrought out by single individuals exclusively, in advance of all others; but that oftener independent minds are running "in the same groove" and like results are come to, independently, by isolated men, who are simultaneously working on in advance of their day and generation.

National Tube Works Company.—The attention of gas-light companies is directed to the advertisement of the National Tube Works Company, page 197, manufacturers of lap-welded steam and gas pipe, tubing and casing for artesian, oil and salt wells (with patent protecting coupling), etc., etc. We understand that this company is one of the largest firms of pipe manufacturers in the United States, and has a reputation second to none. This Company has established an extensive wasehouse at No. 78 William street, in this city.

Lime Hurdles.—Attention is also called to the advertisement of the "Manhattan Lime Hurdle Company," on this page. These hurdles are said to have given perfect satisfaction where they have been used. They claim to combine extreme porosity with lightness, strength and durability. Address—G. W. Day Treasurer, No. 3 Railroad Square, Haverhill, Mass.

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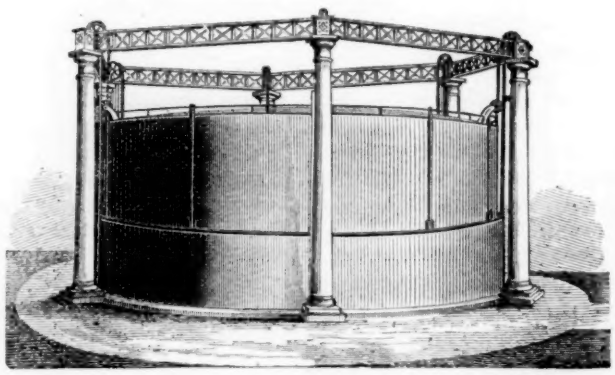

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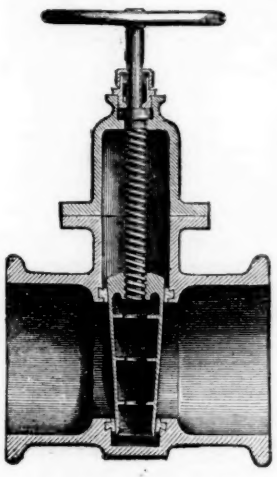
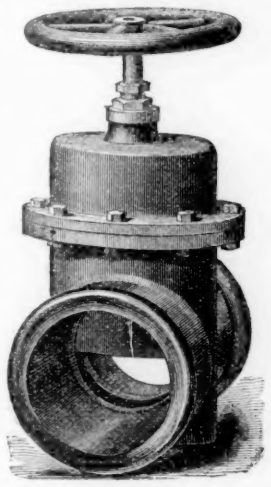




These Valves have been in use for several years, and are pronounced by all who have used them to be

The Best Gas Valves Ever Made.

They afford a direct passage the full size of the pipe. The seats are made of an alloy similar to BABBITT metal, specially prepared for the purpose, and superior to all other metals used for the seats of Gas Valves. It does not corrode under any circumstances to which it is exposed.

There is NO LIABILITY OF COHESION between the Gate and Seat, and the Valves can be relied upon to SHUT TIGHE and OPEN EASILY at all times—an important desideratum when used for street mains, in cases of fire.

We refer to the following named Gas-Light Companies among the many that have used these Valves:

BOSTON GAS-LIGHT COMPANY, BOSTON, MASS.
CAMBRIDGE GAS-LIGHT COMPANY, CAMBRIDGE, MASS.
NEWTON & WATERTOWN GAS-LIGHT CO., WATERTOWN, MASS.
LAWRENCE GAS-LIGHT COMPANY, LAWRENCE, MASS.
PEOPLES GAS-LIGHT COMPANY, BROOKLYN, N. Y.
CITIZENS GAS-LIGHT COMPANY, BROOKLYN, N. Y.
SOUTH BOSTON GAS-LIGHT COMPANY, BOSTON, MASS.
CHARLESTOWN GAS-LIGHT CO., CHARLESTOWN, MASS.
LYNN GAS-LIGHT COMPANY, LYNN, MASS.
FITCHBURG GAS-LIGHT COMPANY, FITCHBURG, MASS.
CITIZENS GAS-LIGHT COMPANY, NEWARK, N. J.
WILLIAMSBURGH GAS-LIGHT CO., WIRLIAMSBURGH, N. Y.

GAS AND WATER VALVES ½ INCH TO 36 INCHES DIAMETER.
STEAM VALVES ½ INCH TO 12 INCHES DIAMETER.
357-tf

CANNELTON COAL COMPANY

Of West Virginia,

Offer to Manufacturers of Gas the pure Cannel Coal from their Colliery at Cannelton, West Virginia. This coal after having been thoroughly tried by the most expert and reliable Engineers, has shown itself to be the most valuable **Enriching agent** produced in this country—a gross ton yielding **10,000** cubic feet of gas, of **64.54** candle power, to purify which, required only two bushels of lime. The yield of coke is **32 bushels** of good quality, quite light, burns freely, making a very hot fire. For further information address

J. TATNALL LEA, Treas.,
P. O. Box 1747. No. 325 Chestnut Street, Phil'a.

PEYTONA CANNEL COAL

From West Virginia.

Yields over **13,000** feet of Gas per ton. At ten thousand feet (standard yield) the illuminating power is over **43** candles. Purifies **4,510** feet to the bushel of lime.

S. E. LOW, Secretary,
354 Office, 58 Broadway.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

Entrance Examinations June 1 and 2, and Sept 23 and 24.
For new Catalogue and late Entrance Examination Papers apply to PROF. SAMUEL KNEELAND,
255-12t Secretary, Boston, Mass.

PROVIDENCE

Steam & Gas Pipe Co.,

PROVIDENCE, R. I.,

BUILDERS OF

Coal and Rosin Gas Works,

FOR TOWNS AND MANUFACTORIES.

Estimates furnished of the cost of Works, and cost to Manufacture Gas in any Locality.

Gasholders,
Iron Truss Retort House Roofs,
Water Tanks,
Purifier Covers,
Coke Barrows,
Cast Iron Socket Pipe.

Particular attention given to Enlarging and Re-building Gas Works.

For Lighting Manufactories, our Rosin Gas Works have been successfully used for *many years* past. They require but a small outlay, and afford a *safe* and *economical* light.

FOR SALE AT MANUFACTURERS PRICES:

EXHAUSTERS AND COMPENSATORS,
IRON AND CLAY RETORTS,
FIRE BRICK, CLAY AND TILE,
ROMAN CEMENT AND ROSIN,
STATION AND CONSUMERS' METERS.

REFER TO

Manufacturers' Gas Co., Fall River, Mass.; Youngstown Ohio, Gas Co.; New Rochelle, N. Y., Gas Co.; Homer and Cortland, N. Y. Gas Co.; Danbury, Conn., Gas Co.; North Bridgewater, Mass., Gas Co.; Cold Spring, N. Y., Gas Co., Rockville, Conn., Gas Co. Taunton, Mass., Gas Co.; Pawtucket, R. I., Gas Co.

FREDERICK GRINNELL, President, J. C. HARTSHORN, Treas.
S. MILLETT THOMPSON, Secretary.

Office and Manufactory, corner of Pine and Eddy Streets, Providence, Rhode Island.

Office in Syracuse, N. Y., No. 1 Granger Block.

H. A. BRANCH, Agent.

AMERICAN

GAS WORKS CONSTRUCTION AND *Supply Company.*

President—JAMES A. TAYLOR, Columbian Iron Works.

Engineer—A. F. HAVENS, late of Brooklyn Ca Light Co., Patentee of the following inventions:

HOISTING ENGINES,
COAL ELEVATORS,
WIRE-ROPE RAILROAD,
TRAYS FOR LIME OR IRON
RETORT CHARGING AND RAKING MACHINE,
RETORT SETTINGS,
SELF-SEALING LIDS,
AUTOMATIC DIP-PIPE SEAL
SECTIONAL PURIFIERS.

The above Patents are the result of many years experience, and are of great value, enabling any Company to increa e the capacity of its Retort and Purifying Apparatus 15 to per cent without change, and at slight cost.

Plans, Specifications, and Details furnished of all Apparatus, and Companies supplied with every thing required in Gas Manufactura, from the greatest to the least, at the lo est market rates.

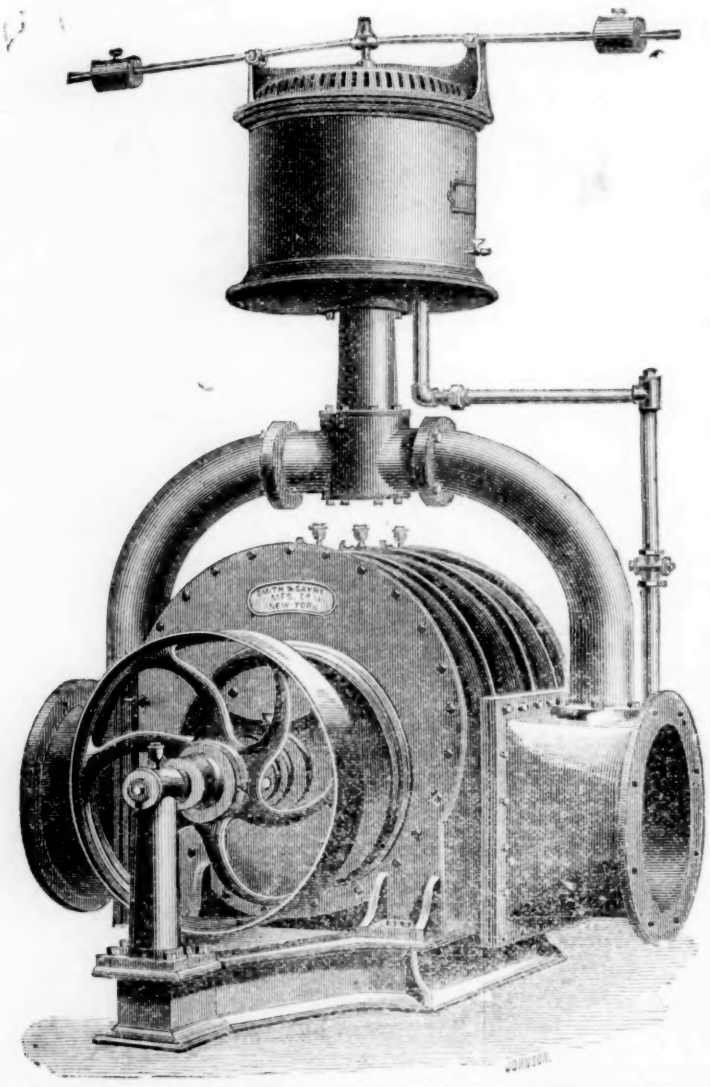
American Gas Works Construction and Supply Company,
No. 61 Broadway.

☞ Mr. HAVENS can be consulted on all matters appertaining to Gas and its manufacture, gratis.

SMITH & SAYRE MANUFACTURING COMPANY.

The Mackenzie Patent Gas Exhauster

And Patent Compensator.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent fuel. Address

G. G. PORTER, President.
CHARLES W. ISBELL, Secretary. JAMES M. SAYRE, Treasurer.
OFFICE, 95 LIBERTY STREET, New York.

AMERICAN

GAS SCREEN MAN'F'G COMPANY.

TO GAS-LIGHT COMPANIES.

Your attention is respectfully called to the GAS SCREEN now being manufactured by the American Gas Screen Manufacturing Company, under the patents granted to E. DUFFEE, and are pleased to submit the following points of their excellence and superiority over all other screens now in use.

The Screen is made with an oak frame, interlaced with split rattan, drawn through holes at regular intervals in the Frame and cross-pieces, the edges of the frame being grooved to prevent abrasion.

The advantages of the screen are:

1st. The large purifying surface, the construction of the Screen giving over three-fourths of the surface for the gas to penetrate the lime.

2d. On account of the free passage of the gas through the screen the pressure is reduced, thereby preventing the accumulating of carbon on the retorts.

3d. The saving of lime and labor, as the Screens are not liable to clog, and are easily cleaned.

4th. Their cheapness and simplicity of construction.

5th. Their DURABILITY—they can be used longer than any other now used.

Testimonials.

PROVIDENCE, RHODE ISLAND, March 21st, 1872

E. UFFE, Esq., Agent, etc.

Dear Sir: The Trays manufactured by you for our West St ation were put in use in September last, and have *given perfect satisfaction.*

The frames are well put together, and I see no reason why hey will not last for a long time. The *very large amount of* pen space in these Trays gives the gas an easy passage, and brings it into contact with the lime much better than when the space is so contracted, as is the case in most of the other Trays in use.

The pressure thrown upon the retorts by contracted passages is very great, and were gauges used more frequently than they now are in many gas-works, this facat of having *open Trays* would become more apparent to mangers of gas works. The digerence in pressure at this station in passing the gas through your purifiers, is two-tenths (2-10) inches.

The amount of gas purified, per bushel of lime used to this date, is six thousand five hundred and fifty six (6,556) cubic feet.

Respectfully yonrs,
JAMES H. ARMINGTON, Supt.

BOSTON GAS-LIGHT CO., Dec. 1871.

Dear Sir: In answer to your inquiry how we like your Patent Tray for dry gas purifiers, I take pleasure in saying we have used them exclusive of all others, for the last three years, and think them far ahead of any yet offered. The surface being nearly three times that of any other Tray, and their lightness and durability perfectly satisfactory.

Yours respedtfully,
A. M. GILES.

EDWARD DUFFEE, Esq.

EAST BOSTON, JUNE 15, 1871.

Gentlemen: We have used your Screens some five years. They give perfect satisfaction.

I consider them *by far the best Screen* for Dry Lime Purifiers I have seen. Yours truly, A. M. NORTON, Supt.

CHELSEA, May 1, 1871.

Mr. E. DUFFEE.

We are using your Purifying Trays, and find them to be the *best of any* that I have used, and will *purify more gas with less pressure* than any tray that I know. I can fully recommend them, after four years trial, to any Gas Superintendent with perfect safety, as the *cheapest and best Tray made.*

Yours truly, JOHN ANDREW, Sup't.

DORCHESTER, March 3. 1870.

Mr. E. DUFFEE.

Dear Sir: We have had your Gas Trays in constant use for almost one year and six months and find them superior to any others we have ever used, both in point of economy and efficiency. Truly yours, W. B. BROOKS,
Agent Dorchester Gas-Light Co.

JAMAICA PLAINS, MASS., June 21, 1871.

EDWARD DUFFEE, ESQ.

Dear Sir; The Trays ordered by this company three years ago, are getting somewhat worn. I wish to say here that I consider your Trays to be superior to any yet invented, therefore please make us another set at the price named, to be like the sample shown in every way, and oblige Yours truly
JAMES F. ROGERS,
Sup't Jamaica Plains Gas-Light Co.

BROOKLINE, June 11, 1871.

E. DUFFEE, ESQ.

Dear Sir: You will please make a set of Gas Trays for this company as soon as convenient, at price named. In regard to the merits of the Tray, after having them in constant use for over two years, I will say that I consider them *superior to any Tray* manufactured in this country. Respectfully yours,
H. A. ALLYN,
Sup't Brookline Gas-Light Co.

BANGOR, August 2, 1870

EDWARD DUFFEE, ESQ.

Dear Sir: Yours of the 20th ult. is received. In regard to your Gas Trays, I take pleasure in saying that they have been in use over two years, and have given perfect satisfaction and they are in good order at the present time; should have no hesitation in recommending them, believing they are the most durable and easiest kept in order of any with which I am acquainted. Respectfully yours,
W. H. PERRY, Sup't.

OFFICE OF THE SPRINGFIELD GAS-LIGHT CO.,
SPRINGFIELD, MASS., Oct. 10, 1871.

MR. WARD,
President Hartford Gas-Light Co.

Dear Sir: I have been using Gas Screens made by the American Gas Screen Company, for nearly a year, and find them superior in every way to the wooden Screens made and formerly used by the Springfield Gas-Light Co. I can purify more gas with the same quantity of lime, there being more surface to the Screens; and I consider them more durable, and recommend them to your consideration.

Yours with great respect,
GEORGE DWIGHT.

ROXBURY, June 14, 1872.

EDW. DUFFEE, ESQ.

Dear Sir: In answer to your inquiry regarding your Patent Gas Screens, I am happy to be able to say, that after nearly three years constant use we are perfectly satisfied with them being able to purify over fifty pet cent. more gas with them than with any other Screen we have used.

Yours respectfully,
THOMAS J. PISHOU

OFFICE DETROIT GAS-LIGHT CO.,
DETROIT, MICH., April 22, 1872.

AMERICAN GAS SCREEN MANUFACTURING CO., HAVERHILL.

Gentlemen: The Screens bought of you work far better than any we have ever used. As a proof, we have with the same quantity of lime purified *twenty per cent.* more gas with your Screens than with any others, and the work well done. The workmen are also better pleased wifh them—they being light and handy to work. They also relieve the pressure very much upon the retorts, and I cheerfully give yau my experience.

Yours truly,
P. E. DEMILL, Secretary.

We give a list of some Gas-Light Companies using them.

Providence, R. I. Gas-Light Co., Boston, Mass. Gas-Light Co.: East Boston, Mass., Gas-Light Co.; South Boston, Mass. Gas-Light Co.; Springfield, Mass., Gas-Light Co.; New Bedford, Mass., Gas-Light Co.; Manchester, N. H., Gas-Light Co.; Reading, Penn., Gas-Light Co.; Biddeford, Me., Gas-Light Co.; Hartford, Conn., Gas-Light Co.: New Haven, Conn., Gas-Light Co.; New Orleans, La., Gas-Light Co.; Savannah, Ga., Gas-Light Co.; Charleston, S. C., Gas-Light Co.; Trenton, N. J., Gas-Light Co.; Charlestown, Mass., Gas-Light Co.; Dorchester, Mass., Gas-Light Co.; Chelsea, Mass., Gas-Light Co.; Baltimore, Md., Gas-Light Co.; Manhattan, N. Y., Gas-Light Co.; Cincinnati, Ohio.; Gas-Light Co.: San Francisco, Cal., Gas-Light Co.: Albany, N. Y., Gas-Light Co.; Sacramento, Cal.; St. Joseph, Mo., Gas-Light Co.; Leavenworth, Kansas, Gas-Light Co.; Macon, Ga., Gas-Light Co.; Roxbury, Mass., Gas-Light Co.; Lansinghburg, N. Y., Gas-Light Co.; Bridgeport, Conn., Gas-Light Co.; Stamford, Conn., Gas-Light Co.; Poughkeepsie, N. Y., Gss-Light Co; Scranton, Penn., Gas-Light Co.; Lewiston, Me., Gas-Light Co., and one hundred others.

Address **R. A. POTTER, Treas.,**
Amer. Gas Screen Man'f'g Co., Haverhill, Mass.
EDWARD DUFFEE, Agent.

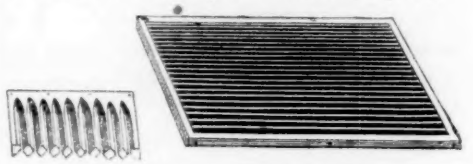
J. L. CHEESMAN.

MANUFACTURER OF

Patent Conically and Diamond Slotted

SOLID WOOD TRAYS.

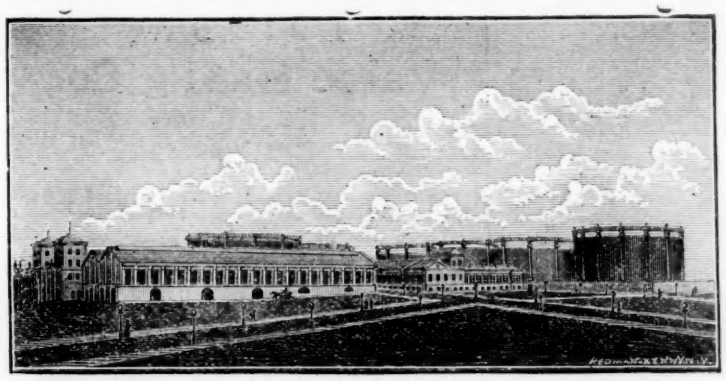
PATENTED OCTOBER 21, 1862 AND JUNE 10, 1873.



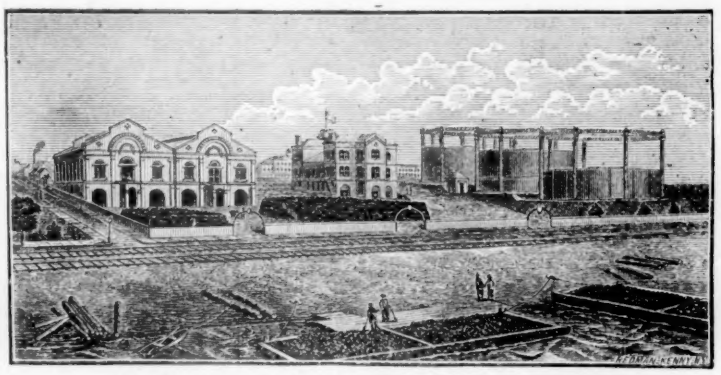
To Gas Companies.

The above Trays will last longer, and are cheaper than any Tray now used. They are now made without any outside strips, which gives more purifying surface, being perfectly smooth. The lime will not adhere to them as in other Trays. They are now used in over three hundred Gas Companies in the United States, and other places.

JOHN L. CHEESMAN,
151 and 153 Avenue C, New York.



CINCINNATI GAS WORKS, ERECTED 1871-72-73.—WM. FARMER, ENG.



LACLEDE GAS WORKS, ERECTED 1872.—WM. FARMER, ENG

WILLIAM FARMER,

ARCHITECT AND GENERAL GAS ENGINEER,

111 BROADWAY, TRINITY BUILDING, Room 95, New York.

WILLIAM FARMER may be consulted upon all matters connected with the construction of GAS WORKS, or any other description of buildings Will furnish General and Detail Drawings, Specifications and Estimates for Gas Works of any capacity.

PATENTEE OF THE FOLLOWING INVENTIONS:

Exhausters for Gas and Foul Lime Ventilation,
Dumping Barrows for Coal, Coke and Lime,
Hydraulic Mains for Retort Benches,
Blowers for Forges, Foundries, &c.
Pumps for Water, &c., &c.

REFERENCES:

Professor SILLIMAN, New Haven, Conn.
GEN. CHAS. ROOME, President Manhattan Gas-Light Company, N. Y.
A. W. BENSON, President Brooklyn Gas-Light Company, Brooklyn, N. Y.
W. W. SCARBOROUGH, President Cincinnati Gas-Light Company, Cincinnati, Ohio.
S. L. HUSTED, President Laclede Gas-Light Company, St. Louis, Mo.
Prof. HENRY WURTZ, Editor AMERICAN GAS-LIGHT JOURNAL, N. Y.
GEN. A. HICKENLOOPER, Vice-President Cincinnati Gas-Light Co., Cincinnati, Ohio.
FREDERICK CROMWELL, Vice-President Laclede Gas-Light Company. St. Louis, Mo.
C. VANDERVOORT SMITH, Engineer Manhattan Gas-Light Company, N. Y.
JAMES R. SMEDBERG, Consulting Engineer, San Francisco Gas-Light Co., Cal. [342

GAS PURIFICATION.

St. John and Cartwright's
NEW IRON COMPOSITION

Has purified, per bushel, on a single test, 10,000 feet of Westmoreland Gas. With revivification lasts indefinitely. Surpasses in POWER and ECONOMY all known materials. Saves largely in FIRST COST, SPACE, LABOR, SUPERINTENDENCE, and all current expenses. Will purify *easily* sulphurous gas, wholly *unmanageable by lime.* Takes out *all the ammonia.* Now operating in the following Gas Works: Harlem, New York (21st street); Port Morris; Hunter's Point; East New York Worcester, Lynn and Cambridge, Mass.; Lewiston, Maine; St, Albans, Vt.; Pawtucket, R. I.; Meriden, Ct.; and being introduced in many other places.

Cost 70 cents per bushel. One bushel for each square foot of Purifier sufficient. Rights to use for life of Patents, for daily makes of gas in thousands; under 25,000 $200; under 50,000, $400; under 100,000, $500; $250 additional for each additional 50,000 per day.

For further information and instructions, apply to
ST. JOHN & CARTWRIGHT,
21st Street and Avenue A, New York Gas Works.

☞ Immediate arrangements are urged, as the demand for e prepared composition is increasing *so rapidly* that delays supply may occur.

B. S, BENSON.

MANUFACTURER OF

Cast Iron Pipes and Fittings,

AND

Gas and Water Mains.

All sizes from 3 to 30 inch cast vertically in 12½ feet lengths

Office & Factory 52 East Monument St.,
BALTIMORE, MD.

OHIO GAS CANNEL,
From the Sterling Colliery.

We are now prepared to place in the market, through our agents as below, a regular and unlimited supply of this valuable Cannel, for gas purposes. The analysis made in 1871 by Prof. WURTZ, Editor of this Journal, at the Laboratories of the NEW YORK GAS-LIGHT COMPANY, gave 47½ per cent of Volatile Matter and 45 bushels to the ton of a fair quality of coke. The yield of gas was at the rate of 9,500 feet per ton of about 27 candle power. It is not highly sulphurous, can be purified by Lime, and the ash from the coke does not clinker. The above test has been fully substantiated as correct, and can confidently recommend trial of the coal.

TUTTLE & GIRTY Proprietors,
Cleveland, Ohio.

GENERAL AGENTS.

Geo. Merryweather, & Co., 111 Broadway.

GEO. STACEY. HENRY RANSHAW. WM. STACEY.

GEO. STACEY & CO.,

MANUFACTURERS OF SINGLE AND TELESCOPIC

GAS-HOLDERS,

AND ALL KINDS OF

Cast and Wrought Iron Work

Used in the Erection of Gas and Coal Oil Works.

Foundry on MILL STREET; Nos. 33, 35, 37 and 39.
Office and Wrought Iron Works on RAMSAY STREET Cincinnati, Ohio.

REFERENCE.

Cincinnati Gas-Light Co.	Baton Rouge, La., Gas Co.
Indianapolis Gas Co.	Saginaw, Mich., Gas Co.
Dayton, O., Gaslight Co.	Oshkosh, Wis., Gas Co.
Covington, Ky., Gas Co.	Peoria, Ill., Gas Co.
Springfield, O., Gas Co.	Quincy, Ill., Gas Co.
Terre Haute, Ind., Gas Co.	Champaign, Ills., Gas Co.
Madison, Ind., Gas Co.	Carlinville, Ill., Gas Co.
Kansas City, Mo., Gas Co.	Bowling Green, Ky., Gas Co
Topeka, Kansas, Gas Co.	Hamilton, Ohio, Gas Co.
Burlington, Iowa, Gas Co.	Vicksburg, Miss., Gas Co.
Nashville, Tenn., Gas Co.	Denver City, Cal., Gas Co.

R. T. Coverdale, Eng'r Cincinnati, and others.

JESSE W STARR & SONS,

Camden Iron Works

Camden, New Jersey,

MANUFACTURERS OF

ALL KINDS OF CASTINGS AND APPARATUS FOR GAS WORKS,

Wrought Iron Roof Frames,

For Retort and other houses Retorts and all castings required for setting them in the latest and most improved model. WASHERS, CONDENSERS, SCRUBBERS and EXHAUSTERS for relieving the Retorts from pressure. PURIFIERS, varying from 2,000 to 2,000,000 cubic feet daily purifying capacity.

Wrought Iron Lime Sieves,

for Purifiers. Station Meters of all sizes.

GAS HOLDERS,

TELESCOPIC AND SINGLE,

With cast iron guide and suspension frames. GAS GOVERNORS or REGULATORS, STREET MAINS, from 1¼ to 48 INCHES DIAMETER, for WATER or GAS. Street Main connections, such as BRANCHES, BENDS, DRIPS, SIEVES, etc.

STOP VALVES, from 3 to 30 inches, for both Water and Gas.

Wrought Iron Work.

All the Smith and Sheet Iron work required in and about Gas Works. 226-tf

JESSE W. STARR. BENJ. A. STARR. BENJ. F. ARCHER.

B. E. CHOLLAR,

Gas Engineer,

914 OLIVE STREET, ST. LOUIS, MO.

376-12t

FREEMAN BUTTS,

Of Cleveland, Ohio.

MINER AND SHIPPER OF THE CELEBRATED AND ONLY GENUINE

Sterling Coal,

also dealer in YOUGHIOGHENY, PITTSBURGH, AND AMERICAN CANNEL. Would refer to the following Gas-Light Companies, who have used the HAND PICKED SELECTED COAL:

New York City, Manhattan and New York Companies, Brooklyn, Albany, Troy, West Troy, Rochester, Buffalo, Oswego, Ogdensburgh, Lansingburg, Newburg, Rome, Palmyra, Geneva, Yonkers, Rondout, Kingston, Albion, Brockport, Seneca Falls, Elmira and Lyons, in State or New York; Cleveland, Toledo, Sandusky, Norwalk, Oberlin, Salem and Fremont in Ohio; Detroit, Ann Arbor, Grand Rapids, Kalamazoo, Jackson and Adrian, in Michigan; Toronto, Hamilton, and Coburg, in Canada; Chicago, Ill., and two Companies in Milwaukee, Wisconsin.

Letters in reference to Coal should be addressed to the General Office of FREEMAN BUTTS, Cleveland, Ohio. 354

MONONGAHELA GAS COAL COMP'Y

Of West Virginia.

OFFICE, 56 EXCHANGE PLACE.
(P. O. Box 432.)
BALTIMORE.

Thomas Gemmell, *President.*
A. Robinson, *Vice-President and Treasurer.*
Benjamin Bissell, *Secretary.*

Mines at Wilsonburg, Harrison Co., W. Va. Shipping Port, Baltimore.

This coal yields of Gas 11,200 cubic feet per ton of 2,240 lbs. and has an illuminating Power of 16.30 st. candles. 350-3m

TYRCONNELL GAS COAL.,

MINED IN TAYLOR COUNTY, WEST VA.

Company's Office, 52 S. Gay St., Baltimore.

CHARLES MACKALL, Secretary.
CHARLES W. HAYS, Agent, Room 7, 111 B'way, N. Y.
SHIPPING POINT—Baltimore, Md.

This coal yields 10,000 cubic feet of Gas, with an illuminating power of over 16 candles. Forty bushels of very superior Coke, with little Ash, and scarcely any clinker. 304-1y

EVENS & HOWARD,

Manufacturers of a superior quality of

Fire-Brick, Clay Gas Retorts,

Gas Tile, Drain Pipe, Fine Ground Fire Clay, &c.

916 Market Street, St. Louis, Mo.
313-3m

NATIONAL FOUNDRY

AND PIPE WORKS.

OFFICE AND WORKS—CARROLL, PIKE, SMALLMAN AND WILKINS STREETS,

PITTSBURGH, PA

WM. SMITH,

Manufacturer of all kinds of GAS and WATER PIPE BRANCHES, CONNECTIONS, T's, ELBOWS, and all CASTINGS USED AT GAS AND WATER WORKS,

We offer special inducements to parties wishing to purchase. My Pipe is Smooth, regular in weights, and cast vertically.

B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.

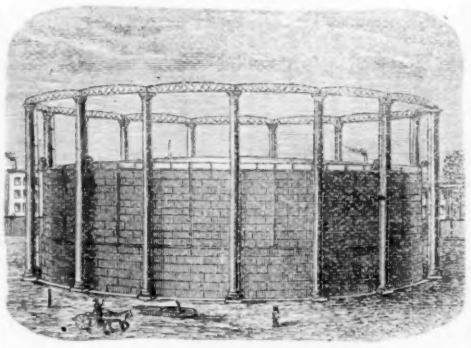
☞SEND FOR CIRCULAR AND PRICE LIST.

T. F. ROWLAND,

Continental Works,

GREENPOINT, BROOKLYN, N. Y.

ENGINEER, AND MANUFACTURERS OF



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OF ANY MAGNITUDE,

Condensers, Scrubbers, Purifiers, Retorts, Hydraulic Mains, and all other articles connected with the Manufacture and Distribution of Gas, furnished with despatch. Plans and Specifications prepared, and Proposals given for the necessary Plans for Lighting Cities, Towns, Mansions, and Manufactories.

B. S. BENSON & SON,

No. 112 BROADWAY, N. Y., ROOM 1.

MANUFACTURERS OF

CAST IRON GAS & WATER PIPE,

And Fittings for Gas & Water Mains, &c.

All sizes from 3 to 30 inches, cast vertically, in lengths of 12½ feet.

NEW YORK AND CLEVELAND GAS COAL COM'Y

Of Pittsburgh, Pa.

MINERS AND SHIPPERS OF

YOUGHIOGHENY GAS COAL.

This Company is prepared to furnish any amount of their justly celebrated, and acknowledged superior GAS COAL, to any point reached by railroad or navigation, on most favorable terms.

General Office—384 Penn Avenue, PITTSBURGH, PA.

Branch Office—C. & P. RR. Coal Pier, CLEVELAND, OHIO.

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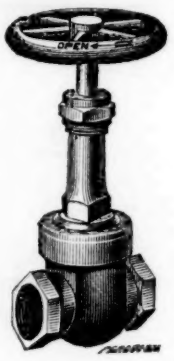

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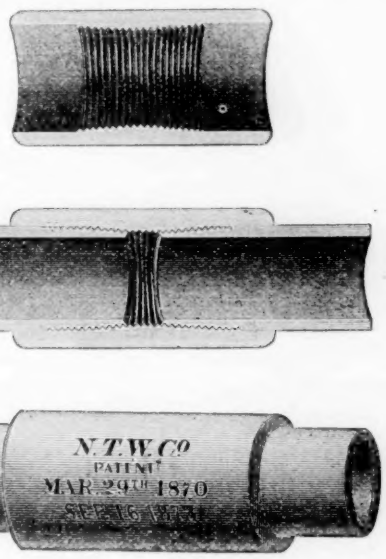

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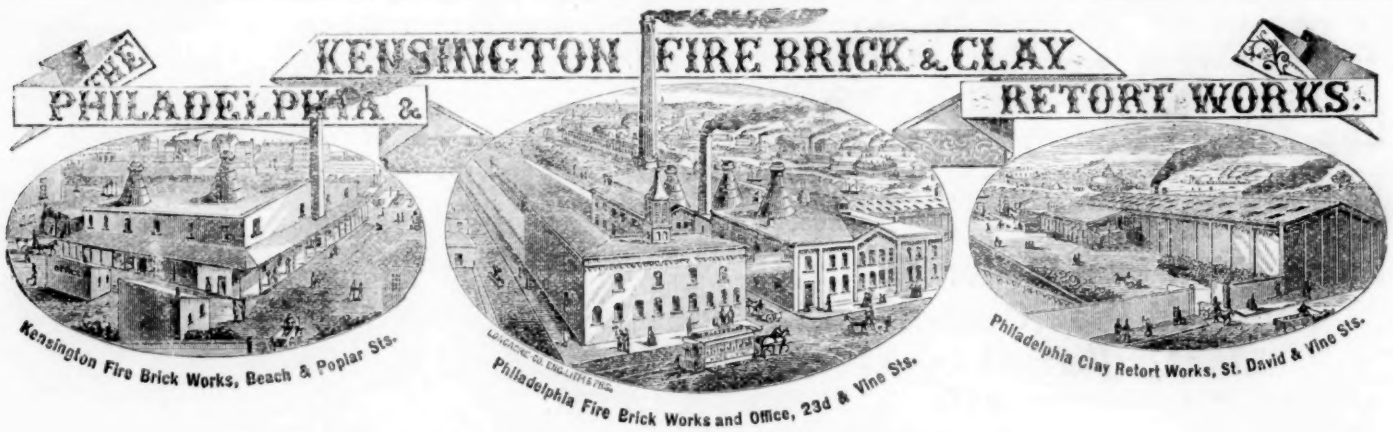
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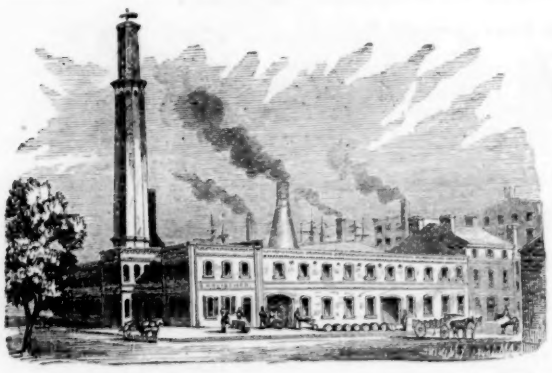

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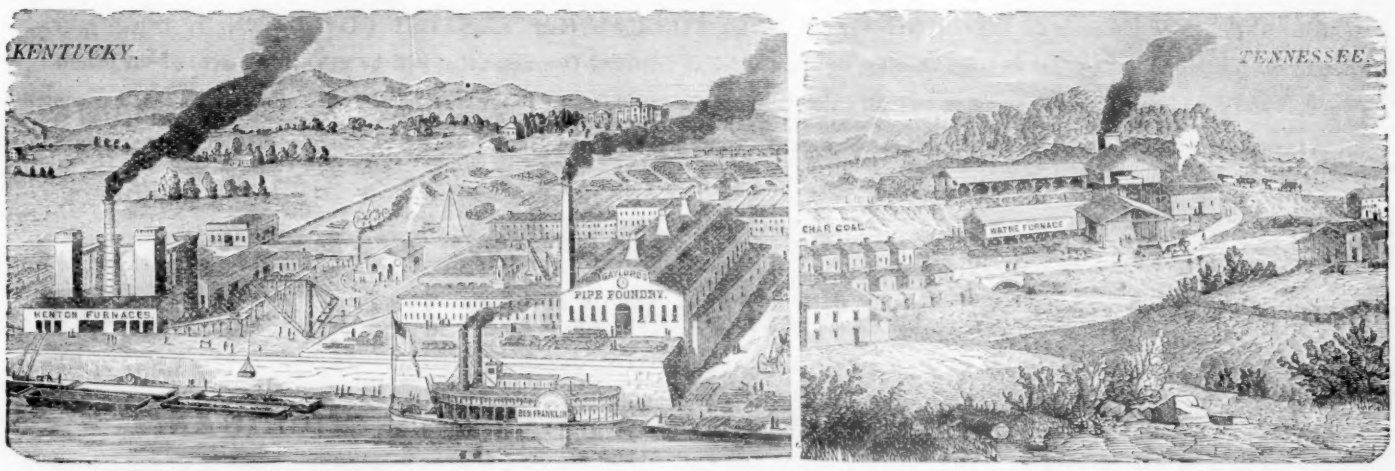

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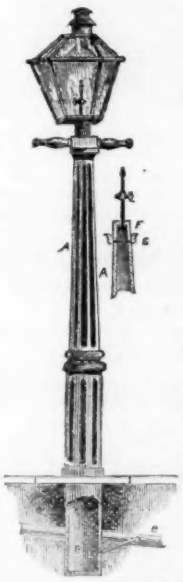

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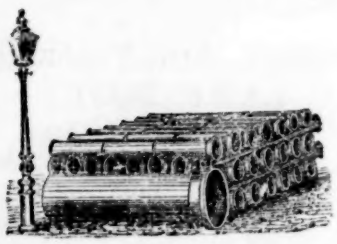

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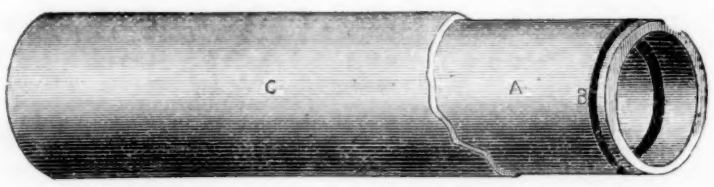
SECTION OF GAS PIPE



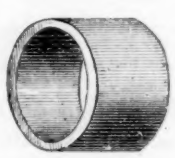


FIG. 2.

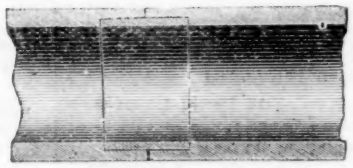


FIG. 3.

A—Cylinder of Wood. B—Band of Iron. C—Coating of Hydraulic or Asphaltum Cemen

FIG. 2.—Thimble for Connection. FIG. 3—Horizontal Section and Connection.

Above is a cut of the

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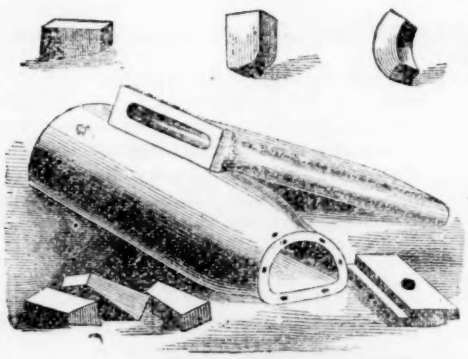

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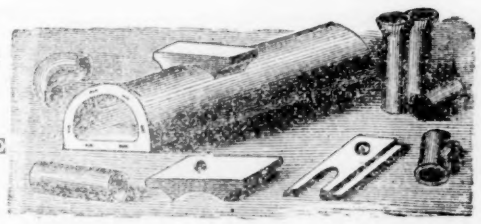

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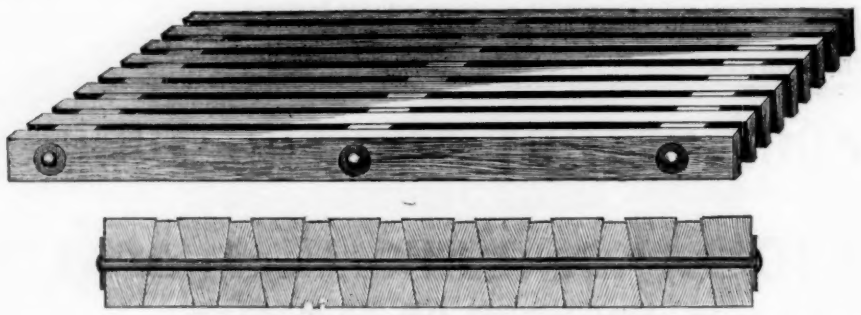

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